NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 39 SEPTEMBER 28, 1987

▶ *NETWORK MANAGEMENT*

AT&T airs net control blueprint

Details plans for integrating tools.

BY PAUL KORZENIOWSKI
Senior Editor

NEW YORK — Leveraging its ubiquitous presence in voice networking, AT&T last week revealed an integrated network management architecture and introduced two products supporting the architecture, presenting the first significant challenge to IBM's NetView.

The company's Unified Network Management Architecture (UNMA) was unveiled at a press conference at AT&T's Madison Avenue corporate offices. The blueprint covers nine voice/data network management areas: fault isolation, performance monitoring, accounting, security, planning, operations support, integrated control, configuration management and custom features.

AT&T did not unveil the archi-

See page 7

▶ *REGULATORY RHUBARB*

Private nets vulnerable in FCC access charge plan

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Access charges the Federal Communications Commission has proposed levying on packet network carriers may also apply to users with private corporate networks, FCC officials confirmed last week.

The FCC plan to charge packet network operators the same type of access charges levied on long-haul telecommunications carriers has stirred up a cloud of controversy and confusion. The FCC has received over 3,300 letters and legal briefs from users and enhanced service providers urging regulators to scrap the plan.

Although most corporate network users believe the access charge proposal affects only en-

See page 62

▶ *PROFILE*

TCA blending local, national voices

BY MICHAEL FAHEY
Senior Writer

SAN DIEGO — Now in its 26th year, the Tele-Communications Association (TCA) is striving to expand beyond its Western roots into a national users group while maintaining its regional chapter-oriented approach to serving telecommunications professionals.

Some 15,000 visitors are expected to gather here for TCA's 25th Annual Conference and Exhibition, which gets under way today. Founded in 1961 by representatives from six Southern California companies, including North American Aviation (now Rockwell International Corp.) and

See page 61

Tele-Communications Association fact sheet

Founded:	June 13, 1961
Charter:	"A forum for exchanging information on regional and national developments affecting telecommunications professionals and the industry"
Headquarters:	West Covina, Calif.
Charter members:	Six
Current membership:	Over 1,000 member companies and 2,500 individual members
First annual conference:	1962 (Exhibitors allowed in 1967)
Chapters:	Arizona, Colorado, Greater San Diego, Northern California, Northwest, Oregon, Southern California
Current president:	Lionel Gillerman, McDonnell Douglas Aerospace Information Services Co.
Chairman:	Prince Dyess, Scripps Clinic and Research Foundation

SOURCE: TELE-COMMUNICATIONS ASSOCIATION

NETWORK LINE

News

- ▶ Enticed by the lure of automated network management, users are seeking the aid of expert systems. Page 2.
- ▶ St. Louis will host an AT&T-supported summit meeting of the System 85 and ETN Users Groups. Page 2.
- ▶ AT&T unveils a customized voice/data network service and announces its first major customer, DuPont. Page 2.
- ▶ Users and vendors applaud the decision of the MAP/TOP Users Group to stabilize MAP standards for at least the next six years. Page 4.

Features

- ▶ To meet its goal of safely and swiftly disseminating voice and data to its customers worldwide, the Canadian Imperial Bank of Commerce takes to the electronic highway. Page 49.
- ▶ Frantic in the phone room? For relief, see this week's product review, which examines two call management systems: Telecalc, Inc.'s MIS-1 and Perimeter Technology, Inc.'s RT-10. Page 63.

NEWSPAPER

▶ *PEER-TO-PEER NETWORKS*

Bank wields net weapons

Chemical Bank PCs get equal access to hosts.

BY JIM BROWN
New Products Editor

NEW YORK — In an effort to boost sales and serve its customers better, Chemical Bank is networking personal computers at more than 200 branch offices to IBM mainframes at its data center here through an advanced application-to-application communications program.

The network will enable Chemical Bank customer service and telemarketing representatives to access customer account files and information about the bank's investment plans, savings accounts and loan offerings. Armed with that information, the representatives will be able to pitch other

See page 61

OPEN SYSTEMS: HOW OPEN ARE THEY?

IBM: Quick to open up SNA, slow to support OSI in U.S.

BY PAUL KORZENIOWSKI
Senior Editor

IBM is walking a tightrope, trying to open its systems architecture to support other vendors' equipment in a way that will increase IBM revenues but not competitors' sales. Because the two requirements aren't always complementary, IBM's current networking strategy is somewhat contradictory. For example, the company proudly proclaims its support for Open Systems Interconnect (OSI) standards but supplies relatively few OSI products for its U.S. customers.

Continued on page 43

NET MANAGEMENT

Users seek automated net control

Expert systems may fit the bill.

BY MARY LINEHAN
Staff Writer

Although expert systems are not yet widely used for network management, the promise of this artificial intelligence technology — often cited as a potential cure-all for network ailments — is moving closer to reality.

Expert systems, which have been successfully deployed for a number of applications in business and industry, are now being sought by users looking to automate net management. Expert systems embody the knowledge of experts in a specific field and are used to diagnose and even solve problems.

"Our client base is looking for solutions to network management and looking at expert systems to control complex networks and minimize staffing requirements," said Bill Maybaum, vice-president at DMW Group, Inc., an Ann Arbor, Mich.-based communications consulting company.

"There are not many products in this area, but there are a lot of prototypes being developed," Maybaum said. "We are in the infancy of this whole set of application opportunities, and the market is very receptive to the idea of using expert systems for network management."

With staffing requirements growing faster than the pool of available network management professionals, the image of a network that can not only pinpoint its own problems but solve them as well is appealing.

"Our work in expert systems was motivated by predictions we made about the number of people we would need to staff the network management center," said Richard Wolf, head of network management planning at AT&T Bell Laboratories.

"With the job of managing a net-

See page 8

USERS GROUPS

AT&T calls user summit

System 85, ETN groups to meet jointly.

BY BOB WALLACE
Senior Editor

ST. LOUIS, Mo. — AT&T's two premier users groups, the System 85 Users Group and the Electronic Tandem Network (ETN) Users Group, will attend a jointly sponsored summit meeting here early next month that is expected to attract roughly 700 to 800 major corporations.

With AT&T's financial and resource support, the AT&T System 85 and ETN users groups, along with up to 200 AT&T System 75 users, will meet Nov. 2 through 6 in what Tom Frenette, president of the System 85 Users Group, termed a test conference. The System 75 users will be informed of plans to establish a separate users group by the first quarter of 1988 for the more than 1,000 customers of the AT&T mid-range digital private branch exchange.

An AT&T spokesman said it was involved with the joint users group effort but would not say if it is part of a larger effort to hone its product marketing effort.

Frenette, one of the event's founders, said the first few days will be spent discussing System 85 and ETN issues. AT&T will address all meeting attendees on Nov. 4. Issues of concern to System 85 and System 75 users will be mulled on Nov. 5 and 6.

The user conference is the cul-

See page 6

Network World wants to make its news coverage even better, and for that we ask your help. If you know of an interesting event that just occurred or is about to occur, please call. We'd also like to know how you optimize your networks. Call Editor Bruce Hoard toll free at (800) 343-6474.

CUSTOMIZED NETWORKS

DuPont buys into new AT&T service

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — AT&T last week unveiled a service designed to provide large companies with custom voice/data networks using the full range of AT&T transmission and net management offerings — a service that has already attracted one major customer, E.I. DuPont de Nemours & Co., Inc.

AT&T's Virtual Telecommunications Network Service (VTNS), outlined in a tariff filed with the Federal Communications Commission, is scheduled to go into effect Nov. 6. VTNS will provide corporations with a single source for custom, integrated digital networks.

The service, available under long-term contract, covers all AT&T offerings brought together to meet customer needs and includes ongoing network management.

DuPont signed a three-year, multimillion dollar contract for VTNS with AT&T on Aug. 7. AT&T and DuPont declined to specify the value of the contract, although industry sources place it between $150 million and $200 million.

The new network will replace DuPont's existing shared Enhanced Private Switched Communications Service and Electronic Tandem Network, according to Michael Toomey, director of telecommunications in the network design division of DuPont.

"VTNS is a service for large customers who realize they are not telecommunications companies with resources to manage vast networks," according to AT&T spokesman James Byrnes.

VTNS will give customers freedom from managing their private networks, said William Rehe, director of enterprise network strategies at Gartner Group, Inc. in Stamford, Conn. "It will guarantee them high-quality service, good availability of transmission capacity and responsiveness to their unique requirements," he said.

AT&T will use customer-provided details about communications needs — such as the volume of voice and data calls, calling patterns, communications applications and network performance requirements — to design networks that are intended to meet particular requirements economically and efficiently. AT&T will decide, for example, where switched and dedicated transmission facilities are needed.

AT&T will offer voice and data transmission capabilities ranging from 2,400 to 256K bit/sec.

VTNS customers must sign a minimum three-year contract for service, and rates will remain con-

See page 6

Corrections: The second chart entitled "Interstate T-1 rates" in the Sept. 21 feature "Pipes of choice" contained two errors. In the LDX Net, Inc. entry, the text in the "Availability" column should read "merger with" rather than "acquires from." Also, the note referring to the National Telecommunications Network (NTN) entry should read only, "Current prices are under review." According to author Robert Ellis, NTN prices will not be quoted specifically between city pairs.

In David Sulser's column, "Users need ISDN now" (*NW*, Aug. 31), the ISDN 2B+D basic rate standard was erroneously referred to as the ISDN primary access standard. Also, the reference to 120K bit/sec communications was incorrect and should have read 120M bit/sec. *Network World* regrets these errors.

Table of contents

TOP NEWS

A healthy, healed William McGowan rejoins MCI Communications Corp. as chief executive, a position he will share with Orville Wright. **Page 6.**

Wang Laboratories announces Ethernet links to its VS line of minicomputers, thus breaking from its traditional reliance on proprietary network links. **Page 4.**

INDUSTRY UPDATE

As in the airline industry, deregulation of the RBHCs will lead to limited competition and high prices, according to consulting firm Economics & Technology. **Page 9.**

TELECOM TRENDS

Pacific Bell and Northwest Bell gain some key participants for their respective Integrated Services Digital Networks field trials. **Page 15.**

LOCAL NETWORKING

Banyan Systems announced a high-performance network server based on Intel Corp.'s 80386 and price reductions for existing servers. **Page 19.**

DATA DELIVERY/ NET MANAGEMENT

Peregrine's PNMS network management software garners high praise from some early users. **Page 23.**

COMMUNICATIONS MANAGER

Experts supply the pros and cons of planning for natural and man-made network disaster. **Page 25.**

NEW PRODUCTS AND SERVICES

Soft-Switch unveils software that allows IBM VM-based computers, including the new 9370, to exchange electronic mail with dissimilar machines. **Page 27.**

FEATURES **Page 34.**

CALENDAR **Page 62.**

TIMEPLEX

We've Redefined The High End Of T-1 Networking By Announcing...

Systems Connectivity Architecture...

the Timeplex philosophy to provide *open systems connectivity* and support to meet current and changing needs of your strategic networks.

TIME/VIEW Unified Network Management System...

an integrated, full-function, multi-user, multi-tasking hierarchical system that, from a single point, enables you to monitor and control your entire network.

TIME/VIEW enhances the native network control capabilities of Timeplex networking products with expert systems and artificial intelligence techniques to ensure maximum network availability. It also embraces non-Timeplex equipment via TIME/VIEW Open Access–a published specification available to customers and vendors. The TIME/VIEW Bridge supports and complements the IBM NetView® network management system.

LINK/100 Series Digital Networking Switch...

a network resource manager that handles up to 144 T-1 lines and up to 15,000 input/output channels–offering true user-initiated switching.

Timeplex Systems Connectivity Architecture is a roadmap to the future. To learn more, contact Timeplex...*the connectivity people*. Send for our SCA brochure, today!

Timeplex®

Timeplex, Inc.
400 Chestnut Ridge Road
Woodcliff Lake, NJ 07675
(201) 930-4600

TIME/VIEW and LINK/100 are trademarks of Timeplex, Inc.

LOCAL NETWORKS

Wang offers Ethernet links for its VS minis

BY PAULA MUSICH
Senior Editor

LOWELL, Mass. — With the announcement of Ethernet connections for its VS line of minicomputers, Wang Laboratories, Inc. last week broke with its tradition of using proprietary networking links to connect its computers.

Wang opted to develop an Ethernet interface for its VS computers — along with a line of cabling components, software and services — in response to customer demand, according to Bob Reason, senior product manager for local-area networks. "There has been a lot of interest in Ethernet connections, especially among our government accounts and defense/business customers," Reason said.

Wang currently sells WangNet, a proprietary broadband network, to interconnect its processors, along with a lower cost version of WangNet called FastLAN.

Industry analysts greeted the announcement of Ethernet support with mixed reviews. David Terrie, president of NewPort Consulting in Scituate, Mass., pointed out that the announcement is incomplete because Wang has not said how terminals or personal computers can communicate with the VS processors over Ethernet. "It's surprising to me that they didn't lay the whole thing out for people," Terrie said. "They obviously have to address PCs fully, along with a twisted-pair wiring plan. It's fair to say there's more to come."

Others pointed out that Wang's initial Ethernet support doesn't include multivendor communications. "The fact that they're only providing VS-to-VS communications stands out," said Gartner Group, Inc. Analyst Bill Redman. "Wang realizes they have to break out of their proprietary stance, but they're playing catch-up. That's better than not playing at all, though."

Wang plans to provide future support for multivendor communications over Ethernet using Transmission Control Protocol/Internet Protocol software for its VS computers. "This product offering is a platform for multivendor communications," Reason said. "It sets the stage for communications with other systems." TCP/IP support is expected during the first half of 1988.

Although Wang said in a statement of direction that it also plans to support IEEE 802.5 token-ring networks, the office systems vendor opted to implement Ethernet now because it has a much larger installed base. "Ethernet has caught on more as a standard. It's only in the last six months that token-ring has taken off," he said. Reason said he expects Wang's token-ring support will not be as extensive as the firm's Ethernet support.

Customers' choice of WangNet vs. the Ethernet option will depend on their networking requirements, according to Reason. Customers who need to support multiple services on the same media and cover greater distances — eight to 10 cable miles — will be best served by WangNet, while Ethernet provides a less expensive, single-service networking option and a better foundation for multivendor communications, he said.

"The choice depends on what's already installed at the site and what services users want to run over the network. The decision boils down to topological considerations," Reason said. Wang's Ethernet implementation can share the same baseband coaxial cable and is compatible with any true implementation of the 802.3 specification.

Wang also added the ability to connect VS systems using Ethernet running in five bands of the WangNet broadband network. Wang previously allowed other vendors' equipment to communicate in this fashion as a part of the multiple services provided in WangNet. Now VS users can take advantage of that capability as well.

IEEE 802.3 hardware components introduced include a VS LAN Controller, which fits into the VS chassis, a VS 10M bit/sec LAN Interface, which attaches to the back panel of the VS or can be plugged into a cable concentrator, and cable kits. Software includes Wang Systems Networking (WSN) VS Netcore Release 8.31 and VS WSN 802.3 Transport software.

The LAN Controller is priced at $2,500; the LAN Interface costs $1,500; Transport software is priced at $750, and the cable kits range from $100 to $300.

MAP/TOP USERS

Group vows to keep MAP stable

BY JOSH GONZE
Staff Writer

DALLAS — Users and vendors at the Fall meeting of the MAP/TOP Users Group here last week applauded a decision by the group's steering committee to stabilize Manufacturing Automation Protocol specifications, a move many said will spur deployment of MAP products.

Steering Committee Chairman Chuck Gardner announced that, for at least the next six years, new versions of MAP will be compatible with the current MAP Version 3.0.

The group's decision to commit to MAP 3.0 is expected to increase MAP product activity by assuring vendors they will get bigger returns on their investments in MAP product development. Users, already nervous about the short life of MAP Version 2.1, applauded the commitment as protection for their own plant network investments.

"For both vendors and users, it's the most significant thing that's happened since MAP was started," said Robert Wuest, an account executive with the computer-integrated manufacturing division of Yourdon, Inc., a software and training vendor in Troy, Mich.

Stu Klein, network designer with the engineering development laboratory at E.I. DuPont de Nemours & Co., Inc., one of the largest manufacturers in the U.S., said, "We expect the MAP 3.0 application will be stable now and that vendors will develop more products for it."

Gardner also said the steering committee rejected a proposal to incorporate the IEEE 802.3 Ethernet standard into MAP. The cost of integrating 802.3 with MAP, which is based on the IEEE 802.4 token bus network standard, would be too high, Gardner said.

In addition, he said, the Technical and Office Protocol and MAP executive committees will be combined into a single committee to be chaired by James Doar of Boeing Computer Services Co.

Attendees were buoyed by four user presentations describing successful MAP implementations. Many potential MAP and TOP users have viewed the dearth of full-scale installations of the networking standards as evidence they are too expensive or impractical to implement.

"We're thinking about implementing MAP, but we want to see how it works for others first," said one attendee, who asked not to be named.

About 350 users, mainly representing large manufacturers such as Union Carbide Corp. and Aluminum Co. of America, attended the two-day meeting. While many support the users group as "corporate affiliates," only a few manufacturers have moved beyond pilot implementations of the standards.

Many attendees expressed keen interest in the next major demonstration of MAP product interoperability, Enterprise Networking Event '88, scheduled to take place in June in Baltimore. During the event, a variety of equipment running different manufacturing applications will be hooked to the same MAP network.

Case studies presented generally positive results of some early production MAP and TOP implementations. Jack Rathsburg, superinten-

See page 6

NETWORK WORLD
An IDG Communications Publication
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
617-879-0700

Editor
Bruce Hoard
Managing Editor
John Gallant
Features Editor
Steve Moore
Assistant Managing Editor — News
John Dix
Assistant Managing Editor — Production
Lisa Guisbond
Senior Editors
Paul Korzeniowski
Paula Musich
Pamela T. Powers
Bob Wallace
Senior Writer
Michael Fahey
Staff Writers
Josh Gonze
Mary Linehan
New Products Editor
Jim Brown
Washington, D.C. Correspondent
Karyl Scott
1273 National Press Building
529 14th Street NW
Washington, D.C. 20045
West Coast Correspondent
Mary Petrosky
501 Second Street
Suite 600
San Francisco, CA 94107
Senior Assistant Features Editor
Robert Mitchell
Assistant Features Editor
Bruce Guptill
Associate Editors
Peter Hoffmann
Beth Lazarus
Copy Editors
Joanne McQuaid
Anne Ryder
Samantha Shubert
Art Director
Dianne Barrett
Informational Graphics Designer
Susan Champeny
Assistant to the Editor
Cheryl Tynan
Contributing Editor
John J. Hunter

Publisher
Gary J. Beach
Administrative Manager
Mary Fanning

Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-215-630-0500.

Non-qualified subscribers: $3.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. and Canada only to qualified management or professionals who specify and maintain communications equipment and systems, including voice, data and video, as well as to common carriers, consultants, systems houses and manufacturers of communications equipment.

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

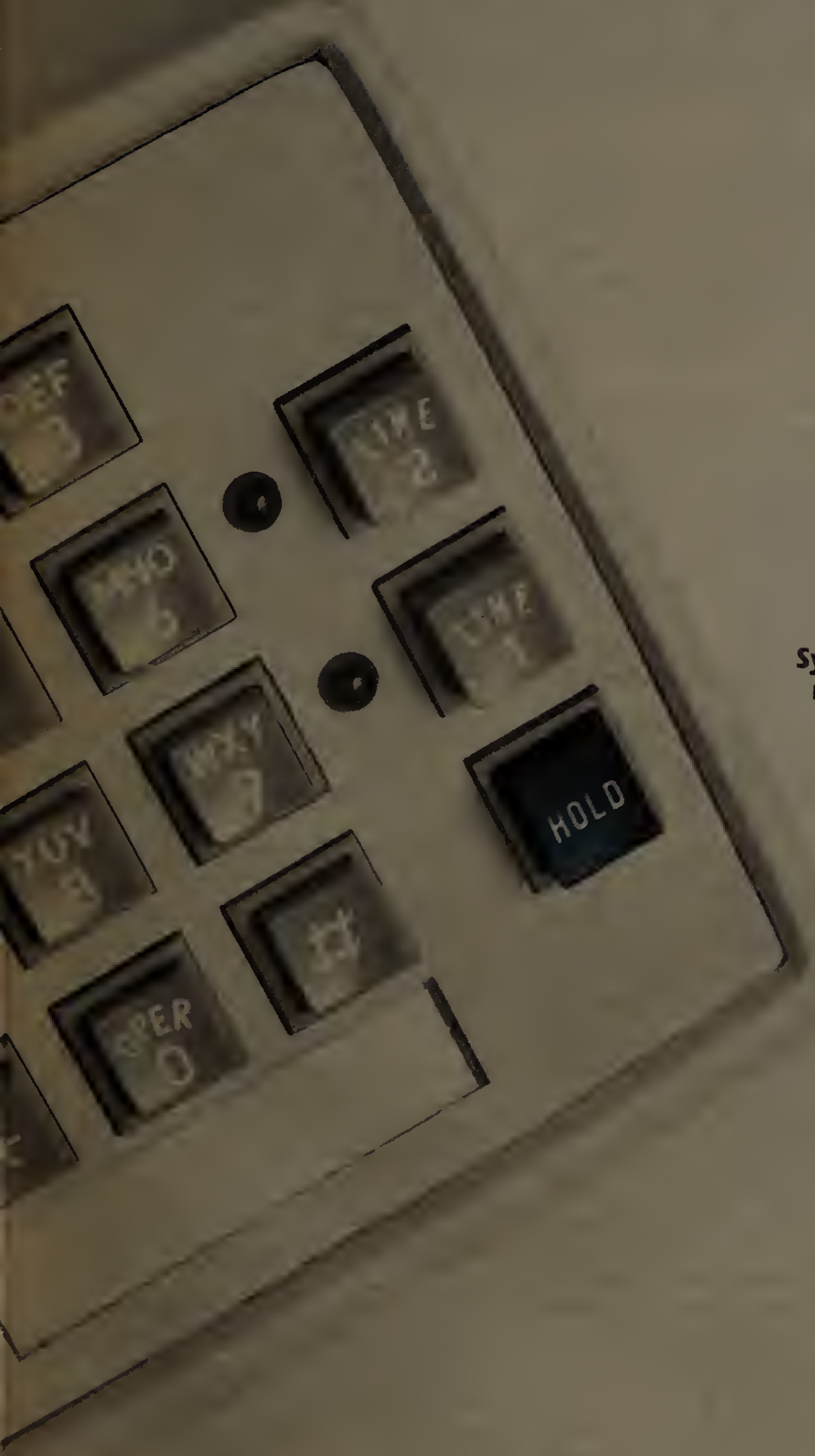
Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

POSTMASTER: Send Change of Address to *Network World*, Box 1021, Southeastern, Pa. 19398-9979.

Copyright 1987 by CW Publishing/Inc. All rights reserved. Reproduction of material appearing in Network World *is forbidden without written permission.*

Special requests for reprints and permissions only should be addressed to Nancy M. Shannon, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

PROFITS ON HOLD?



Sykes COMM-TRAKS™ Call Management Systems can let your profits ring through. When it comes to Telephone Cost Management, Sykes can provide you with micro-processor-based (UNIX™ and MS-DOS) software systems and peripherals that will save you up to 40%. Our COMM-TRAKS software includes client billback, network optimization, call allocation and billing verification for the resale, commercial and professional services markets. Now, you can have the information you need on the specific reports you require. For single or multiple-site applications, COMM-TRAKS Software is multi-tasking, multi-user-designed for PBX, Centrex and Key Telephone Systems. Profits on hold? Call Sykes today!

SYKES®

A Tradition in
Telecommunications Technology

Sykes Datatronics, Inc.
375 Orchard Street
Rochester, New York 14606
(716) 647-8030

Dealer Inquiries Welcome

AT&T calls user summit

continued from page 2

mination of an 11-month effort, initiated in 1986, to explore the benefits and drawbacks of bringing together the AT&T System 85 Users Group and the AT&T ETN Users Group. Numerous users, including Black & Decker Corp., Westinghouse Electric Corp. and Unisys Corp., use System 85 PBXs in an ETN environment.

The presidents of the two groups disagree on the effect that holding meetings at the same time will have on their respective relationships with AT&T. Ron Maciejewski, president of AT&T's 200-company strong ETN Users Group and communications systems director for Trinova Corp. in Toledo, Ohio, said the event will strengthen the group's relationship with AT&T, provide users with a higher degree of influence on AT&T's product and service development efforts, and forge a stronger bond between members of both users groups.

"The meeting will represent a larger show of force from AT&T customers," Maciejewski asserted. "The ETN Users Group has been striving for more input on AT&T's product enhancement and new product development programs." He forecasted that bringing the groups together would help the group achieve this goal.

But Frenette, who is also network communications manager for Towson, Md.-based Black & Decker, said the sheer size of the group may weaken the 300-company strong System 85 Users Group's close relationship with AT&T and muffle user-to-user interaction at the conference.

"Pooling the two groups' users will not give us more clout with AT&T," Frenette said. "[The System 85 Users Group] sessions have been very interactive. Users have been very willing to open up. But, if you put 1,000 people in one room, the environment will change. The value of such a large meeting would degrade to where it is not useful for users anymore.

"We already receive outstanding support from AT&T in both maintenance of equipment and products and in addressing policies that are detrimental to us."

Frenette added, however, that holding the meetings at the same time would enable members of both groups to realize several benefits. "The ETN Users Group covers many of the same areas that we cover at the System 85 Users Group meeting. Some of the user sessions could be held jointly," he explained.

"This meeting would serve as an impetus for users of both groups to begin thinking of their communications systems in more holistic terms," Frenette said. He acknowledged that holding the meetings concurrently would cut travel costs and time commitment for users holding membership in both groups.

Kevin Sexton, premises product marketing district manager for AT&T System 75, System 85 and PBX systems management products, claimed the joint meetings would not weaken ties between the two users groups and AT&T.

"I think this meeting is going to improve our relationship with our users," Sexton predicted. "It gives them a larger forum, and it gives us the ability to dedicate a lot more resources to the meeting than we could for three separate meetings covering System 75, System 85 and ETN users."

Frenette said AT&T is expected to provide roughly 60 speakers, including three top product planning and marketing heads, for the five-day event. "Users at the meeting will be able to learn in one week what would take months to learn on their own," he said.

Three top AT&T officials — Jack Bucter, product marketing and management vice-president for AT&T's PBXs and central office switches, Don Hirsch, a product planning and development head for the same product line, and Jack Healey, services vice-president for AT&T's Network Operations Group — are expected to deliver separate keynote speeches at the event here.

In addition to the 60 AT&T officials provided as speakers, 60 speakers drawn from the System 85 Users Group and the ETN Users Group are scheduled to address the massive user throng.

▶ *MANAGEMENT*

MCI chief returns

BY PAM POWERS
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. last week said William McGowan will rejoin the company in the newly created office of chief executive, a post he will share with Orville Wright, who was elected acting chief executive during McGowan's recuperation from a heart transplant in April.

McGowan rejoins MCI after a nine-month absence that began when the chairman suffered a heart attack in December. In April, Wright, former MCI president and chief operating officer, assumed McGowan's duties. Now acting as vice-chairman, he and McGowan will "chart the strategic direction of the company as equals," said MCI spokeswoman Kathleen Keegan.

Keegan said McGowan's return doesn't affect the responsibilities of Bert Roberts, who continues as president and chief operating officer in charge of day-to-day operations. The existing five-person management committee made up of Roberts, Wright, two executive vice-presidents and the chief financial officer, will remain the same, with Roberts now reporting to the joint chief executives.

The move to share strategic responsibilities between Wright and McGowan affords McGowan some rest time, although Keegan said he will be working "almost full time."

Group vows to keep MAP stable

continued from page 4

dent in General Motors Corp.'s Engineering Manufacturing Group, discussed how GM is using a plant-wide MAP network in a truck and bus plant factory as part of the GMT-400 project.

The network became operational in 1986 and involves 45 miles of broadband cable. It links area manager computers from Digital Equipment Corp., Hewlett-Packard Co. cell controllers, GMF Robotics Corp. robots, Cincinnati-Milacron, Inc. welding robots and Allen-Bradley programmable logic controllers.

Other working MAP applications presented by users included those of E.I. DuPont and Boeing Computer Services. A working TOP installation set up by the U.S. Air Force was also discussed.

TOP status

The status of TOP is not as well-defined as that of MAP, since less product development and installation work has been done in that area. But attendees were generally optimistic that TOP will eventually replace other technical office protocols such as Transmission Control Protocol/Internet Protocol. "TOP is not dead. MAP needs TOP for peer-to-peer communications," said Asa O. Bishop Jr., professor of electrical engineering at the University of Tennessee.

Willem Roelandts, general manager of the Information Networks Group at HP and the meeting's keynote speaker, also expressed confidence in TOP's prospects. "I think TOP is struggling now, but that will not be so in the long term," he said in an interview with *Network World*. MAP has not had to battle other manufacturing standards while TOP has to overcome other protocols, he said.

MAP-related products announced at the meeting include Concord Communications, Inc.'s Event Starter Kit, software that lets users migrate MAP 2.1 applications to Version 3.0 by changing the application interface.

Concord also introduced a bridge for linking Ethernet subnetworks to a broadband backbone. Called the 4200 Series, the device provides digital-to-analog modem services as well as the necessary protocol bridge.

HP, a leading proponent of MAP, released a MAP 2.1 interface for the HP 9000 Series 800 and HP 1000. Roelandts explained the reasoning behind HP's support of MAP as part of a strategy to overtake its much larger competition, saying, "We have to do a better job connecting with them than they have to do connecting with us."

DuPont buys into AT&T service

continued from page 2

stant for that multiyear period. Charges will include a fixed monthly fee based on the number of voice and data circuits as well as the type of dedicated and switched facilities used. VTNS will also include per-minute usage charges and a one-time installation fee.

Industry analyst Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said, "This is a very important event for AT&T because the more they are able to sign customers up for long-term contracts and tie up all their traffic, the more they will have a captive audience."

According to AT&T's tariff, "VTNS is designed to be responsive to customers with complex voice and data telecommunications requirements who are seeking a network managed by AT&T. VTNS provides these capabilities as a single service, unlike existing services that each provide a discrete type of voice or data capability."

The DuPont network will initially handle all DuPont voice traffic and eventually all data traffic between 200 U.S. sites housing some 80,000 end users.

DuPont currently has about 400 million minutes of EPSCS traffic per month, according to industry sources who asked not be identified.

"This new network will allow us to integrate voice and data in a high-capacity T-1 digital system that is compatible with our existing communications architecture," Toomey said.

The network will consist of a T-1 digital backbone interconnecting four major network nodes in Wilmington, Del., Charleston, S.C., Ponca City, Okla., and Houston. Digital transmission capabilities will also be deployed to as many end-user locations as possible, he said.

Software-defined network service will be used to interconnect remote locations such as sales offices and small manufacturing and distribution facilities. A single dialing plan will be used throughout the network.

DuPont will utilize its existing Network Equipment Technologies Co. (NET) IDNX/70 and IDNX/40 multiplexers to route traffic onto the network. DuPont has 12 IDNXs installed and plans to acquire more as the new network is implemented, Toomey said.

The DuPont IDNXs currently support 45 T-1 links: 1,248 voice lines and 164 data lines, according to Sham Rane, NET IDNX product manager.

AT&T airs net control blueprint

continued from page 1

tecture's cornerstone, a product to integrate network management information from various systems in a common data base. The cornerstone product will have a distributed architecture, according to John Miller, director of network management market planning.

AT&T said UNMA would conform to the Network Management Protocol (NMP) standard defined by the International Standards Organization's Open Systems Interconnect (OSI) model. The company will publish its interpretation of NMP in the next few months.

One day after the announcement, Timeplex, Inc. and Avanti Communications Corp. pledged to support AT&T's efforts. Of the vendors that have proposed their net management systems as de facto standards, only IBM has been successful in gaining support of other manufacturers.

One of the two products, the Accumaster Consolidated Workstation, provides a consistent interface for access to individual AT&T network management systems. Initially, the Consolidated Workstation, which runs on an AT&T 6300 series personal computer, will support six products.

Two products, Dataphone II System Controller and Dataphone II 839A Dial Backup, control the company's modems and multiplexers. The Consolidated Workstation also supports: the Dataphone II Acculink Network Manager, used to manage the company's T-1 multiplexers; the Starkeeper Network Management System for Datakit, a virtual circuit switch; and Accunet T1.5 Service with Customer Controlled Reconfiguration Option. The workstation can also control Accumaster Trouble Ticket, a private branch exchange management tool announced last week.

By using the Consolidated Workstation's windowing capability, network operators can monitor, for example, a T-1 line in one window and conduct a T-1 multiplexer test in another window.

AT&T also plans to link the Consolidated Workstation to many of its other products, including: its Routing Control Service, used to controls WATS lines; Multifunction Operations System, which manages a 5ESS central office switch; the Service Management System, which controls its Software-Defined Network service; and Order Management Service, which is used to manage network inventories.

The Consolidated Workstation includes an IBM 3270 terminal-emulation feature so an operator can access NetView, IBM's host-based network management system. AT&T's Miller said the company will not support NetView/PC, a gateway that links other vendor's network management systems to NetView.

"We want a higher level interface than the one NetView/PC provides," Miller said.

The second product, Accumaster Trouble Tracker, controls up to 400 AT&T System 75, System 85 or Dimension PBXs. The product, which runs on an AT&T 3B2/400 computer and uses Informix SQL data base, stores alarm information in a data base so users can track network performance, product reliability and trends.

Trouble Tracker translates alarms from Dimension, System 75 and System 85 PBXs, as well as attached products such as AT&T's Audix voice mail and Information System Network, into a common format. All network alarms are automatically logged and users can examine a chronology of alarms or a tally of problems.

The product's alarm-forwarding feature routes alarms through a network based on time of day or type of equipment. It also automatically creates trouble tickets.

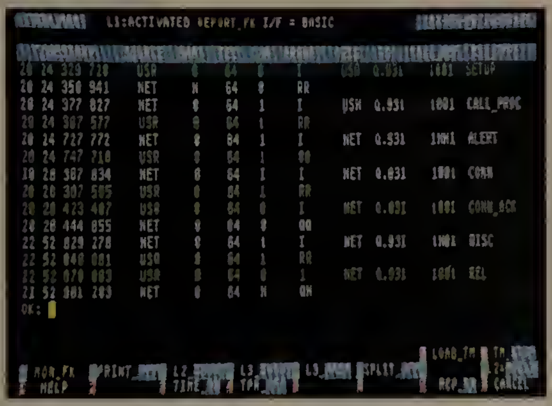
Atul Kapoor, vice-president at Kaptronix, Inc., a consulting firm in Haworth, N.J., said AT&T was wise to base its strategy on its strength — voice communications. However, the company's network management products still function autonomously and resemble IBM network management products before they were consolidated in NetView.

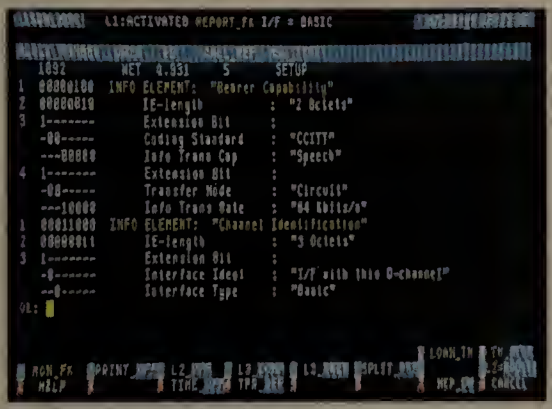
He said AT&T will have to push for the OSI standards to be clarified. AT&T, US West Network Systems, Inc., Codex Corp. and Digital Communications Associates, Inc. have all promised that their products will support OSI network management standards. AT&T's Miller admitted that vendors have different interpretations of the standards.

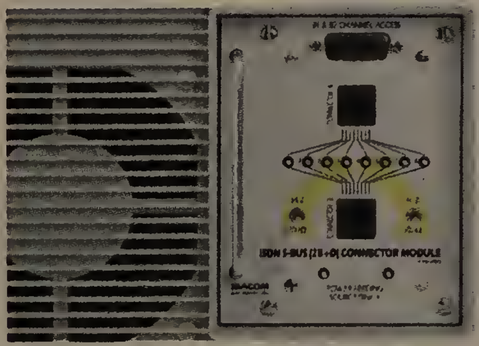
Michael Dortch, senior analyst at the San Francisco office of The Yankee Group, said, "The standards process enables vendors to scream motherhood and apple pie from the rooftop while continuing to develop proprietary products." Vendors are working to ensure their interpretations are similar, Miller said.

The Accumaster Consolidated Workstation costs between $7,000 to $15,000 and will be generally available in the first quarter of next year. The Accumaster Trouble Tracker sells for $60,000 and will be available in the second quarter of next year.

THE PERFORMANCE MACHINE
FOR
ISDN TESTING
IPT468
From US $37,400.00 down







Order now with these features:

- Primary Rate Interface 1.544 or 2.048 Mbps (23B+D or 30B+D)
- Basic Rate Interface 192 kbps (2B+D)
- Monitor S/T interface
- Simulate NT or TE
- Full decoding and analysis of Q.921 and Q.931
- Automatic emulation of Q.921 and Q.931
- Internal B-channel emulation and monitoring
- External B-channel access (TTL)
- *Soon to be announced:*
- CCS No. 7 testing, ISDN certification tests and conformance test suites for Telematic terminals including X.25, TELETEX, FACSIMILE Gr. IV and Mixed Mode.

IDACOM

IDACOM Electronics Ltd. Edmonton R&D Park 9411 20 Avenue Edmonton AB T6N 1E5 FAX (403) 450-1020 TLX 037-3315 PHONE 1-(800)-661-3868.
OVERSEAS: SIEMENS AG E680, Kommunikationsmessgeraete, Postfach 700079, Hoffmannstrasse 51 D-8000, MUENCHEN 70

Users seek net control

continued from page 2

work becoming more and more complex, we're going to need expert systems to be able to survive," he said. "We've been struggling to use artificial intelligence and expert system technology for years now."

Florida-based Harris Corp. has developed its own personal computer-based expert system for in-house use to troubleshoot the company's IBM Systems Network Architecture network. Harris' Network Problem Determination Expert System (NPDES) has helped reduce the company's network and operations staff from 62 to 36 in two years.

NPDES can pinpoint software problems and provide status information about devices on the network.

Utilizing an expert system shell, which provides the inference engine for the system, the program follows 200 rules — a series of if-then statements — input by Harris technicians using knowledge acquired from Harris network experts to advise operators on locating and solving network problems.

"NPDES is an internal product, but since we've started talking about it, we've heard from a lot of people outside Harris who are very excited about it," said Charlie Snell, director of communications and computing at the company. Snell said the company has not decided whether to sell the expert system.

Harris' success notwithstanding, Maybaum said only the largest companies can afford to develop expert systems to meet their own needs. "Companies would have to have the resources — both money and people — and would need corporate commitment to build such a system and bring it out of the prototype stage," Maybaum said.

According to Julie Schoenfeld, director of marketing at Avant-Garde Computing, Inc., the financial payback from marketing an expert system isn't always there either. "It has been difficult for [vendors] to justify putting these products on the market because rule base maintenance is so difficult," Schoenfeld said. "A system is only as good as its rule base, and that rule base must be constantly updated. Capturing all the knowledge necessary is not an easy matter."

AT&T Bell Laboratories' prototype Network Management Expert System (NEMESYS) is "a tool that will allow AT&T network managers to gain advice on what manual techniques they should be using to control congestion on the long-distance network," Wolf said.

"We're talking about an expert system having the ability not only to know what constitutes an important problem but also being able to scan a tremendous amount of data at a very high speed," he added. "The system could look through data equivalent to what we would need 500 people sitting at terminals to wade through. This represents a very powerful application."

NEMESYS will be deployed on the public switched net, working in conjunction with AT&T Bell Laboratories' Network Management Operation Support (NEMOS) system to manage the dynamic nonhierarchical routing network.

GTE Data Services is developing expert systems to aid both large data network users and telephone operating companies in improving network efficiency. "We really have a foot in two camps," said Bob Walford, manager of advanced technology.

"We're concerned with the needs of the large data users that operate networks and with network management for the telephone operating companies," he said. "The only way we can see the needs of both being met is through expert system technology."

Sit back and relax. Because whether you're in financial or information services, manufacturing or transportation, AT&T can offer you a wide range of first class transmission services domestically and internationally.

Our cable and satellite services can handle bulk data processing and on-line interactive applications, at high or low speeds. So we can tailor our services to meet your particular needs.

And, once you've chosen an AT&T telecommunications service, you can rest easy. Because AT&T provides you with not only high quality transmission, but the support of our 15 international offices. And the benefits of our long-standing relationships with foreign PTTs.

So, no matter how much you need to send, or how often you need to communicate overseas, there's one thing you can count on.

AT&T comes through.

Call now to find out how. **1 800 222-0400.** Our Sales Representatives will be delighted to tell you how we can cater to your every telecommunications need.

From equipment to networking, from computers to communications, AT&T is the right choice.

AT&T
The right choice.

NETWORK WORLD
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

Use the
attached form
to get your own
FREE subscription
to
Network World.

You can also use the form to make any necessary changes to your name and address.

INDUSTRY UPDATE

Western Union's restructuring begins

After several false starts, Western Union Corp.'s planned restructuring is now proceeding apace. The Securities and Exchange Commission has declared effective the registration statements proposing the merger of Western Union and L-Tel Acquisition, a firm controlled by investor Bennett S. LeBow. LeBow masterminded the merger plan now under way, which calls for L-Tel to acquire ITT World Communications, Inc. and combine its operations with the ailing Western Union.

VENDOR VIEW

DAN RAUP

T-1 awaits the fifth generation

Over several generations, the T-1 market has evolved to address growing voice and data networking needs. The fifth-generation T-1 multiplexer, which will emerge in the not-too-distant future, will bring together the benefits of several old incarnations and help provide a smooth migration to Integrated Services Digital Network.

Initially designed to handle voice requirements, the earliest T-1 networking devices were channel banks that multiplexed 24 analog signals onto a single T-1 line. Considered a relatively old and limited technology, channel banks were quickly superceded by point-to-point multiplexers that used newer electronic components and advanced technology for more efficient transmission of voice and data.

As the use of T-1 spread, third-generation products were introduced that combined multiple-link T-1 configurations and AT&T compatibility with software control to offer increased capacity and operating flexibility. The software-based, multilink T-1 products integrated network management capabilities such as priority-based automatic routing, overbooking through dynamic bandwidth allocation and alternate configurations.

The next stage of T-1 development offered an upward migration path for users with growing voice and data requirements. Targeted at large-scale users with sophisticated T-1 backbone networking needs, fourth-generation T-1 products incorporate network-switching capabilities for greater functionality and improved cost performance. Networking T-1 multiplexers support local hub and remote-site configurations and handle a variety of line formats and transmission speeds to accommodate large nodal nets.

Amid industry predictions of an impending shakeout in the T-1 market, fourth-generation T-1 product development has surged to meet the growing volume of data networking requirements. Because of rapid growth, high-end T-1 users are now facing another unfolding T-1 phase that looms near. Indeed, the arrival of the fifth-generation T-1 networking solution will lay the necessary groundwork for ISDN networking by giving users more freedom of choice.

The fifth generation of T-1 alternatives will cross over several product categories to incorporate functionality previously provided by separate networking devices. Specifically, this integrated network processor will combine high-speed connectivity with data switch and matrix switch functionality to help users optimize performance and cost savings.

To accomplish this, the next generation of T-1 products must support flexible data-handling capabilities such as keyboard select routing, queuing and automatic connect and disconnect. Designed to optimize bandwidth and resource utilization, other features include resource contention for accessing and sharing networkwide resources.

Foremost, the integrated network processor will become the central processing point for all network operations. With it, users can easily implement matrix switching capabilities. For example, network personnel using a high-end integrated network pro-

See page 10

Raup is product manager at Infotron Systems Corp. in Cherry Hill, N.J.

ANALYSIS

Deregulation chokes network competition

ETI report compares RBHCs to airlines.

BY PAM POWERS
Senior Editor

The continued deregulation of the regional Bell holding companies will result in a market climate similar to that of the airline industry, which is plagued today by limited competition and high prices, according to Economics & Technology, Inc., a Boston-based consulting firm.

In the August issue of the firm's newsletter, "Trends in Communications Regulation," Lee Selwyn, company president, discusses the similarities between the airline and telecommunications industries, both of which have been deregulated in recent years.

Airline deregulation brought about the introduction of the hub system, which requires passengers to traverse central hub cities such as Atlanta and Chicago to reach their destinations.

This allows the airline to achieve improved economies of scale by operating planes at higher capacity. Hubs that serve a large number of network points are, therefore, the most cost-efficient.

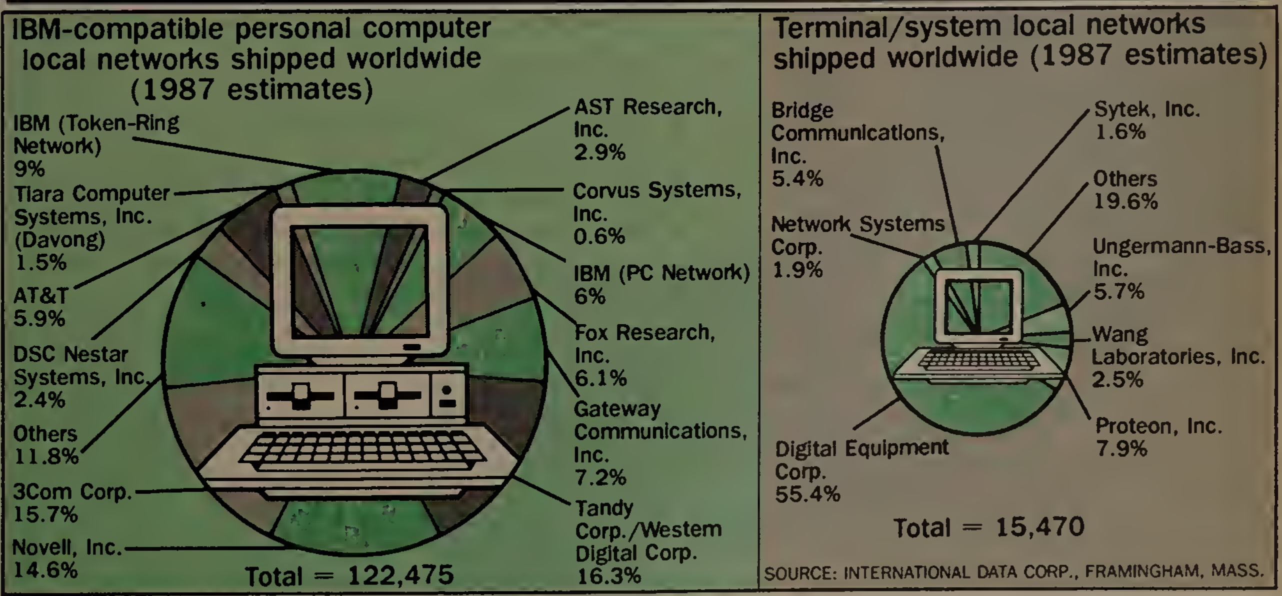
Deregulation also allows the airlines to penalize, with higher fares, those passengers who choose to connect with a competing carrier from the hub to their destination.

That system, according to the article, confers market power to those airlines with the largest hub networks and creates "substantial entry barriers, which may be far more severe in limiting competition than the prederegulation routes administered by the Civil Aeronautics Board."

That dominance, the author contends, enables carriers to price service to and

See page 11

How local network vendors stack up



IBM-compatible personal computer local networks shipped worldwide (1987 estimates)

Terminal/system local networks shipped worldwide (1987 estimates)

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

BRIEFS

In an effort to pare costs, **Southern New England Telephone Co. (SNET), Pacific Bell** and **Bell Atlantic Corp.** all recently offered early retirement to some members of their management staffs.

SNET said it expects between 300 and 500 of its 4,300 managers to take advantage of a companywide early retirement incentive package to be offered on Oct. 1.

The move is "not just a one-shot deal," a spokeswoman said, but part of an ongoing effort to cut costs that will extend into 1988 and will involve limited hiring and redeployment of some staff.

Pacific Bell, which initiated a similar program that cut its ranks by 1,200 workers in 1985, would not predict how many employees are expected to take advantage of its offer.

Bell Atlantic offered early retirement to 5,400 managers, primarily in the Network Services Group, which includes its telephone companies. Its incentive plan, which is part of a corporatewide restructuring, requires all takers to be off the payroll by March 1, 1988.

Timeplex, Inc. announced its intention to purchase **Cygnus Computer Corp.**, a Dallas-based start-up that manufactures an X.25 fast-packet switch.

Timeplex already has an OEM agreement with Cygnus, under which Timeplex sells Cygnus Timepac packet-switching systems,

See **Briefs** page 14

▶ *LOTUS DEVELOPMENT*

Lotus drops its copy protection for 1-2-3

Eases LAN use of spreadsheet software.

BY PAULA MUSICH
Senior Editor

CAMBRIDGE, Mass. — Lotus Development Corp. said it will drop copy protection in the next release of its popular Lotus 1-2-3 software, a decision that will make it easier to use the spreadsheet software in a local-area network.

Copy protection has made it difficult for users to run 1-2-3 on a local net server, which would allow users to share spreadsheets. While awaiting the overdue networked version of 1-2-3, dubbed the Networker, many users have resorted to breaking the software's copy protection in order to install it on servers ("Users still await networked 1-2-3," *NW*, July 13).

Most of those users have sidestepped legal issues by buying a copy of 1-2-3 for each network user and then running a single copy on the server. According to Andrew Seybold, chairman of the Seybold Group in Santa Clara, Calif., "People are buying enough copies so that everyone on the network has a license, and then they use only one copy."

But, technically, that practice is technically a violation of the single-user license, which Lotus is not changing. However, Lotus is more concerned with illegal copying — so-called pirating — of the software, and most large users have established antipiracy policies to thwart that practice.

"We have been in the process of making this decision since August of 1986," said Greg Jarboe, Lotus' director of corporate communications. Since then, he said, Lotus has taken some steps toward that end, including releasing new products without the copy protection scheme. "Market research indicated that the vast majority of users want [copy protection] removed, and we determined that the most appropriate time to do that was with the next release of 1-2-3," Jarboe explained. The release is scheduled for shipment in the first quarter of next year.

While the decision to remove copy protection was seen as important, network users will benefit more from the multiuser capabilities promised in the Networker, which was due to ship in the first quarter of this year. The product is still not generally available, and Lotus will not say when it will ship.

Not all network users believe copy protection removal is important. "We tried to install Lotus on a server once, but it took so long to get Lotus files delivered to PCs on the network that it wasn't worth doing," said one user who asked not to be identified. "The multiuser aspect of sharing spreadsheets is overrated. Most of our spreadsheets have single authors. We'd rather have someone alter a copy instead of the original. Very rarely do two people have to work on the same spreadsheet."

T-1 awaits the fifth generation

continued from page 9

cessor can control and manage a wide mix of incompatible equipment without the constraints of cumbersome, manual patch panels.

The ability to set alarm and status criteria allows network managers to personalize their control systems and address specific needs. Extended control lets network managers set a 3270 multidrop port to generate an alarm on loss of polls. Also, support of front-end processor- or modem-sparing maintains vital data flow while avoiding costly outages in a disaster recovery environment.

Other features such as clock transparency and digital bridging will become staple items in the fifth-generation T-1 products.

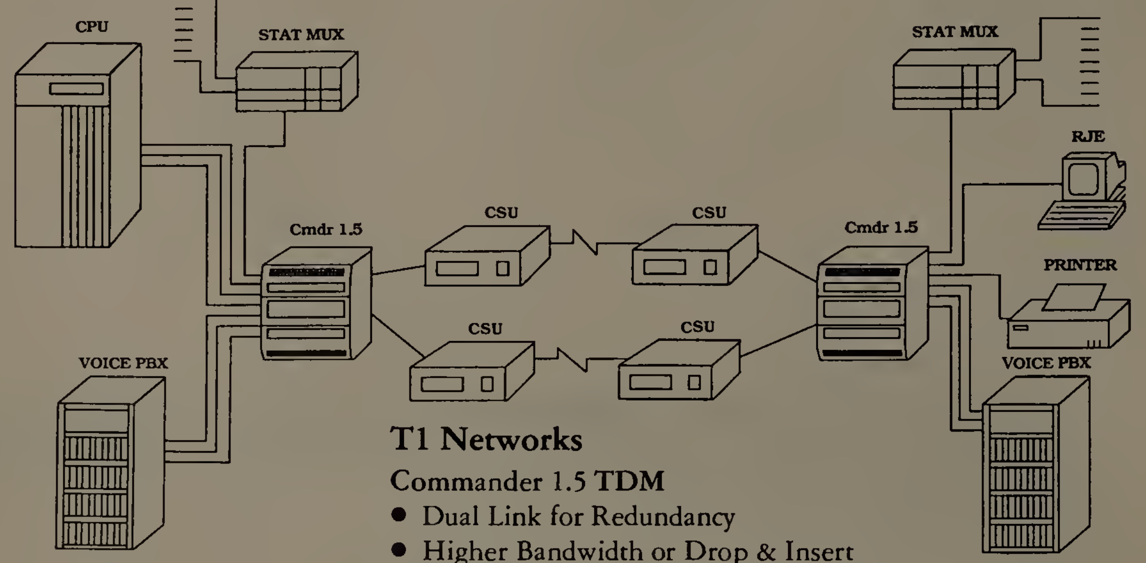
To ease the integration of network processors into existing networks, transparent clocking capabilities allow users to mix and match other carrier services and explore transmission options ranging from satellite and fiber to microwave, without concern about incompatible clocking sources. Digital bridging significantly reduces the need for bandwidth and front-end processor ports and maximizes resource management.

By integrating the voice/data network within the traditional analog, multidrop network, digital bridging helps users reduce transmission costs associated with synchronous, multidrop networks. Finally, more advanced voice-handling capabilities will enable

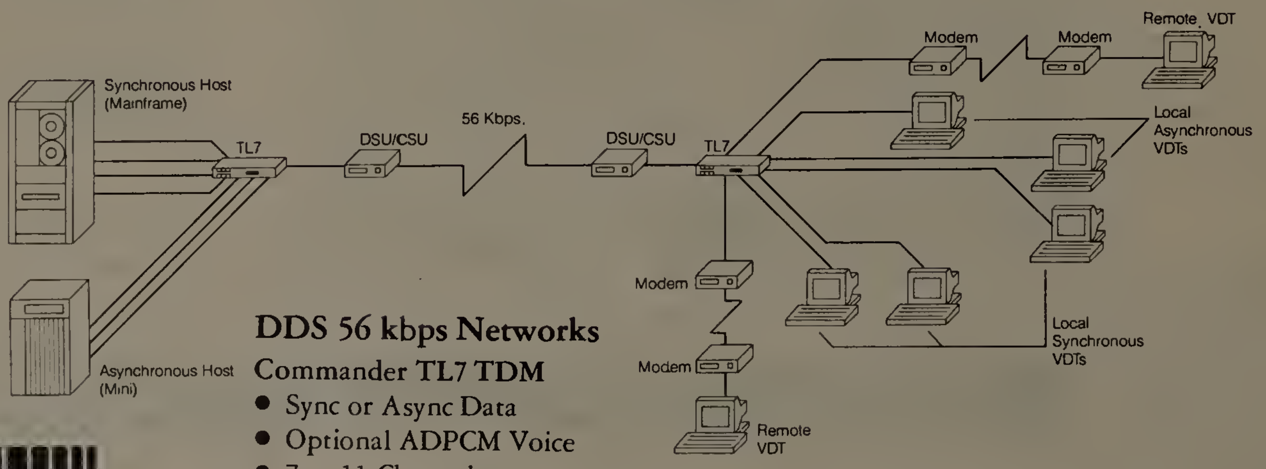
See page 11

Need a Wide Area Network for Voice and Data?

ITRON manufactures a full range of networking products from 4-channel statistical multiplexers to T1 integrated voice/data multiplexers to sophisticated data PBXs and premises networks. Our products are covered by a full 12-month warranty and are backed by Infotron field service professionals who provide fast, reliable service.



T1 Networks
Commander 1.5 TDM
- Dual Link for Redundancy
- Higher Bandwidth or Drop & Insert
- Redundant Power & Logic Option
- PCM or ADPCM Voice
- Data Channels Sync or Async
- DACS Compatible M24 or Native Mode
- Advanced Console Control & Management



DDS 56 kbps Networks
Commander TL7 TDM
- Sync or Async Data
- Optional ADPCM Voice
- 7 to 11 Channels
- Integral DSU/CSU Option
- Advanced Soft-Selectable Clock Modes
- Multi-Drop Tail Circuits
- Advanced Console Control & Management

ITRON
An Infotron Division

130 Gaither Drive
Suite 116
Mount Laurel, NJ 08054
800-423-8044 609-722-5575

CALL ITRON TODAY!

ITRON is committed to providing proven, state-of-the-art communications equipment through professional, authorized independent distributors. Our distributors combine strong local support with ITRON's engineering and manufacturing expertise to offer economical, yet flexible and expandable communications solutions.

Deregulation chokes

continued from page 9

from hubs at a higher per-mile rate than routes of comparable distance that don't traverse hubs and, consequently, have greater market competition.

The problem with the hub system, which the article claims is comparable to the networks the RBHCs control, is that it places the most powerful assets — the central hub routes — in the hands of a few, thereby stifling competition.

This concentration of power is even more prevalent among the RBHCs than the airline carriers, the article suggests.

"Most telecommunications network resources involve large fixed capital investments that can be most efficiently recovered when the resource is shared among a number of users.

> The solution is to allow entry and innovation on the part of non-RBHC firms, recognizing that their presence in no way constrains the market power of the RBHCs.

"Thus, the degree to which the owner of network resources is able to achieve and maintain an efficient scale of operations will materially affect its ability to achieve and maintain an advantageous market position vis-a-vis present and future rivals."

Therefore, the article insists, the suggestion that there is competition in major communications markets is similar to saying that the "isolated instance of a private or corporate airplane constitutes consequential competition to the certified common [airline] carriers."

And yet, proponents of further deregulation of the communications industry cite competition as the main reason why policy should be changed.

Fritz Ringling, a vice-president with Booz, Allen & Hamilton, Inc. in Washington, D.C., noted that the utilities may be capable of introducing competition in the communications market because they can run fiber over their rights of way and offer raw bandwidth and customized private networks to business customers.

But, he said, "neither those companies nor any others could offer the scope of services available through the RBHCs because the barriers to entry are just too high."

The solution, the article states, is to allow entry and innovation on the part of non-RBHC firms, recognizing that their presence in the marketplace in no way constrains the market power of the RBHCs. Only through economic regulation of the dominant carriers, the author suggests, can we curb the market power the RBHCs currently wield.

Ringling agreed that the industry needs economic regulation to ensure that all customers pay reasonable prices for the facilities and services they use through the RBHCs. "The RBHCs still have a de facto monopoly, despite the nominal existence of competition," he said. ▣

T-1 awaits generation

continued from page 10

users to take advantage of compressed voice, monitor and control traffic and provide a more cost-effective means of moving both data and voice throughout the net. Ultimately, fifth-generation products will encompass a broader range and greater number of technologies. For instance, enhanced T-1 network processors will feature various interfaces to public X.25 and ISDN networks to cost-effectively interface to data terminal equipment or customer premises equipment. Integrated T-1 network processors will be a stepping stone to ISDN connectivity in the private/hybrid networking domain. ▣

As an IBM user, are you looking for an answer to the network interoperability question?

Multi-vendor networking is the most severe challenge faced by network designers today. How do you bring together the strengths and benefits of IBM & DEC & AT&T & Workstations & PC's? With networking solutions from ACC.

ACC's ACCES/MVS software provides the TCP/IP protocol suite to the MVS environment in a way that will bring a smile to the face of your systems programmers. Our ACS 9310 brings Ethernet directly into your IBM mainframe and together with ACCES/MVS can open up the resources of your computer to the entire corporation.

ACC has been providing knowledgeable, insightful and reliable solutions to data communications requirements for Commercial, Government & Academic users for over ten years. Learn more about how ACC can make your network truly interoperable. Call today.

Advanced Computer Communications,
720 Santa Barbara St., Santa Barbara, CA 93101
(805) 963-9431.
TWX 910 334-4907.

ACC®

Yes ACC, let me know how you can help me with multi-vendor networking.
I'm interested in:

☐ IBM mainframes
☐ IBM PCs
☐ DEC computers
☐ AT&T computers
☐ TCP/IP protocols
☐ Ethernet

Name ______
Company ______
Address ______
City, State, Zip ______
Phone ______

Mail to: Advanced Computer Communications
720 Santa Barbara Street, Dept. N1, Santa Barbara, CA 93101
Phone (805) 963-9431

When the Class of '96 wanted and communications worked

Recently, a group of curious third graders visited NEC. We showed them what we've shown thousands of curious executives—that in today's business world, increased productivity starts with a concept called C&C. Computers and Communications working together. C&C is an effective solution for the managing and moving of information.

C&C Computers and Communications

In your office, C&C means quality NEC products such as advanced personal computers, digital telephones, and high-speed facsimile terminals, all working together through a powerful Information Management System (IMS).

For your corporation,, it means local and wide area networks, using NEC technology to

to learn how computers
together, NEC showed them.

carry voice, data, text and image information around a building. Or around the world.

Today, NEC has an impressive record of solving complicated networking problems for companies of all sizes. Whether it's creating your first system, or adding to an existing one, we're with you every step of the way.

If you'd like to learn how Computers and Communications can work together for your business, please write or call:
NEC America, Inc., Corporate Marketing,
8 Old Sod Farm Road, Melville, NY 11747
Telephone:
1-800-626-4952
(in New York
1-516-293-3015)

NEC

Briefs from page 9

which were recently introduced in Europe and Canada.

Timeplex said the value of the acquisition will be determined based on the sales performance of the Cygnus switch. Cygnus posted revenue of $400,000 in 1986.

Farmstead Telephone Group, Inc., a Glastonbury, Conn.-based company that markets used telephone gear, signed a letter of intent with the Chinese company **Weihai No. 1 Radio Factory**, under which Weihai will sell refurbished AT&T private branch exchanges and key systems to businesses in China. The proposed agreement calls for Farmstead, in conjunction with AT&T, to train Weihai staff in reconditioning, installing and maintaining the equipment. Weihai would also be responsible for marketing and shipping operations within the country.

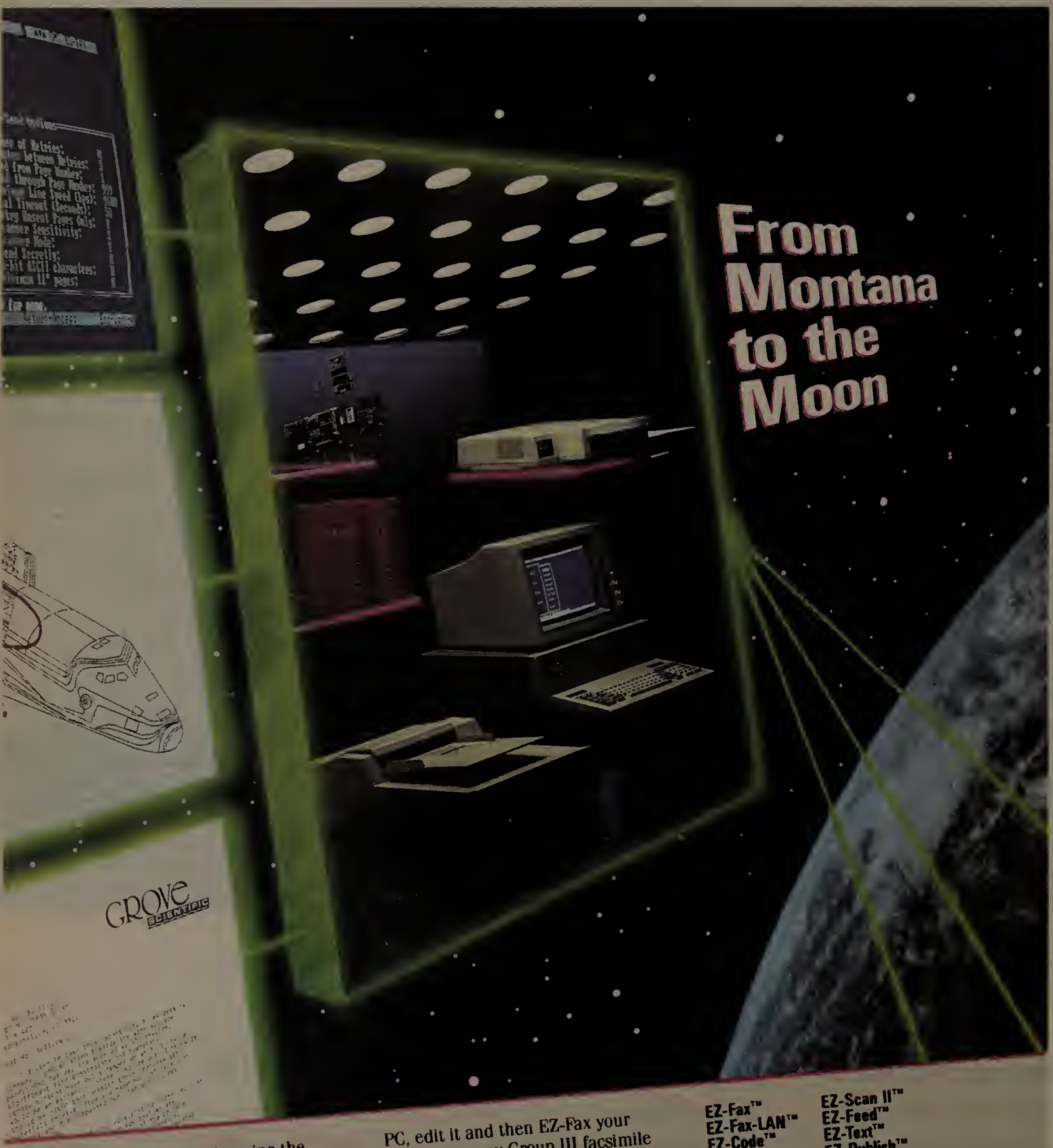
A Farmstead spokesman said the company expects to sign a binding agreement with Weihai in the first quarter of 1988. He added that in its first year of operation, the joint venture plans to sell some 10,000 PBX lines. The spokesman said Farmstead expects to sell about $10 million worth of equipment over the agreement's three-year period.

Avanti Communications Corp., a vendor of networking T-1 multiplexers, has appointed Tom Taylor to the post of president. Taylor most recently served as senior vice-president for business systems and services for Telenet Communications Corp. Prior to Telenet's merger with the former Uninet, Inc., Taylor was president of Uninet.

Outlining his strategy for Avanti, Taylor said the company will "continue building private T-1 networks but will greatly expand its market thrust toward carrier-based applications. [Our] customers will have powerful private networks that interconnect with public networks."

The telephone systems group of **Alcatel N.V.** has commenced U.S. production of its Opus line of business telephone equipment, including small private branch exchanges. The move is part of a program aimed at moving all Alcatel telephone product manufacturing to the U.S. By year-end 1988, a spokesman said, all Alcatel communications products will be manufactured here.

Alcatel's decision to shift operations to the U.S. comes at a time when many American companies have moved their operations overseas to take advantage of reduced labor costs. "Alcatel's manufacturing capabilities are geared toward serving our target markets," the spokesman said. "Since we have a large commitment to the U.S., we didn't want to be importing all that equipment from France to sell it here." ◘


From Montana to the Moon
GROVE

Technology is changing the way we communicate. Successful businesses, large and small, must provide a variety of information in a variety of forms to a variety of destinations – quickly.

GMS brings high speed communications capability to your desktop with a product line based on a combination of innovation and proven technology. You can EZ-Scan text and graphics directly into your PC, edit it and then EZ-Fax your message to any Group III facsimile machine in the world.

Simply put, whether as a stand alone or connected to a LAN, your PC has just become more productive and your office more efficient.

Call today for complete information about the GMS EZ Product Line.

EZ-Fax, EZ-Fax-LAN, EZ-Code, EZ-Data, EZ-Scan II, EZ-Feed, EZ-Text and EZ-Publish are registered trademarks of GMS, a division of DEST. Patents Pending.

EZ-Fax™
EZ-Fax-LAN™
EZ-Code™
EZ-Data™
EZ-Scan II™
EZ-Feed™
EZ-Text™
EZ-Publish™

GMS
A DIVISION OF DEST
VISUALIZING THE FUTURE IN IMAGE PROCESSING
1065 S. Rogers Circle
Boca Raton, FL 33487-9912
1-800-443-0500 Fax 1-305-994-9661

SEE US AT COMDEX BOOTH W430 (WEST HALL)

These GMS products are available through the following distributors:

FA Components
Seattle, WA
In state 800-321-8012
Out of state 800-428-1412
Ft. Wayne, ID
In state (219) 432-8540
Out of state 800-331-7587
New York, N.Y.
In state (718) 507-1444
Out of state 800-847-4148
Greenville, S.C.
In state (803) 288-2422
Out of state 800-845-2747
Largo, FL
In state 800-237-5583
Out of state (813) 541-2618
Birmingham, AL
(205) 979-5778
Marietta, GA
(404) 828-4614

MP Systems
Dallas, TX
In state 800-441-1325
Out of state 800-854-8885
Laguna Hills, CA
In state (714) 770-8411
Out of state 800-824-1688

Federal Data
Washington, D.C.
In state (301) 294-8682
Out of state 800-638-8018

Tek-Aids, Inc.
Austin, TX
In state 800-252-8156
Out of state 800-531-5188
Philadelphia, PA
In state (215) 337-3220
Out of state 800-235-3200
Chicago, IL
In state (312) 870-7400
Out of state 800-323-4138

Americom Distributors
Marietta, GA
In state (404) 428-8400
Out of state 800-727-8400
Tampa, FL
800-727-8400
Memphis, TN
800-727-8400
New Orleans, LA
800-727-8400

Micro D
Santa Ana, CA
In state (714) 540-4781
Out of state 800-842-7831

Softsel
Inglewood, CA
In state (213) 412-1700
Out of state 800-645-7778

Crystal Computers, Inc.
Kansas City, KS
In state 800-432-0170
Out of state 800-541-3030
Denver, CO
In state 800-824-4886
Out of state 800-824-8259
Dallas, TX
In state 800-442-4551
Out of state 800-452-2533

Micro United
DesPlaines, IL
In state (312) 297-1200
Out of state 800-323-1783

Bertex
Mississauga, Ontario (418) 238-3554
Calgary, Alberta (403) 251-7588
Winnipeg (204) 837-4727
Montreal (514) 885-4230

CDI Computer Distributors
Vancouver, British Columbia
(604) 984-0641
Calgary, Alberta
(403) 250-5706
Markham, Ontario
(418) 479-7500
Ville St. Laurent, Quebec
(514) 333-8280

GMS
A DIVISION OF DEST

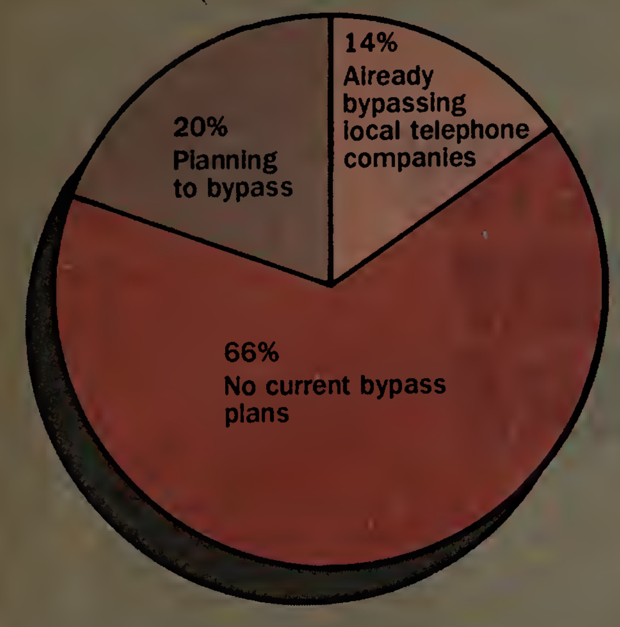
TELECOM TRENDS

IVANS members get MCI discount

The Insurance Value-Added Network Services Corp. (IVANS) has entered into an arrangement under which its members, including more than two dozen insurance companies and their underwriters, can receive as much as a 10% discount on MCI Communications Corp.'s daytime calling services.

IVANS members include such large users as Aetna Life & Casualty Co., The Chubb Corp. and The Hartford insurance companies.

Users' local bypass plans



Information based on a recent survey of 292 users.
SOURCE: THE MARKET INFORMATION CENTER, INC., MARLBOROUGH, MASS.

KEY SYSTEMS

Chicago family gets 7% of TIE

Pritzkers buy into firm.

BY BOB WALLACE
Senior Editor

SHELTON, Conn. — TIE/communications, Inc., a manufacturer and distributor of key telephone systems and private branch exchanges, said last week it plans to sell roughly 7% of its preferred stock to a Chicago-based family for $35 million.

TIE would not say if the stock sale, which would give the investors 17% voting power in the company, is part of a larger plan to strengthen its financial position.

The stock is to be sold to HCR Partners in Chicago, an investment group controlled by the Pritzker family. TIE declined to provide any additional information on the partnership. If the planned stock purchase is completed, the Pritzkers will become the second largest TIE stockholder group, behind TIE Chairman and Chief Executive Officer Thomas Kelly Jr.

TIE had second-quarter 1987 losses of $2.66 million on revenue of $60.1 million, down from $84.2 million for the similar quarter in 1986.

In the event that TIE proposes a merger with a second company, sale of the firm or an acquisition, the preferred stock can be converted into common shares in a time span shorter than the usual 27-month period, according to TIE. TIE would not say whether this stock conversion option was a special concession made to the Pritzkers as part of the agreement.

As part of the deal, the Pritzkers have signed a five-year agreement promising not to increase their stake in the firm to more than 20% of the total voting power of the company without TIE's approval. TIE said it will retain the right of first refusal should the Pritzkers sell any of their TIE stock. The vendor said the Pritzkers will have the right to be represented by two directors on TIE's board of directors.

ADVANCED SERVICES

BOCs widen ISDN trials

Lockheed, Control Data set to field-test applications.

BY MARY PETROSKY
West Coast Correspondent

Local exchange support of Integrated Services Digital Network services was given a boost recently when Pacific Bell commenced its first ISDN field trial and Northwestern Bell signed on a large Centrex user for a field test scheduled to begin in November.

The Pacific Bell trial is scheduled to last 16 months and includes Lockheed Missiles and Space Company, Inc., Hayes Microcomputer Products, Inc. and AT&T Network Systems Group. Northwestern Bell, for its part, has added Control Data Corp., a large Centrex user, to the list of participants in its Minneapolis-St. Paul ISDN field trial, slated to begin Nov. 1. The BOC is also trying to persuade several large area banks to join Control Data in its field test.

Lockheed, the principal customer participant in the Pacific Bell trial, will be evaluating ISDN for a number of applications with an eye to the technology's cost-effectiveness, according to Jim Mathieu, supervisor for telecommunications planning at Lockheed. Participating in the ISDN trial will also "allow us to influence [Pacific Bell's] product development for future capabilities," Mathieu noted.

Pacific Bell's AT&T 5ESS central office switch will be used to provide Lockheed's Sunnyvale, Calif., campus with 37 Basic Rate Interface ISDN lines. The switch will also be used to provide Hayes and AT&T with two and three ISDN lines, respectively. Pacific Bell plans to use 14 lines for central office testing and demonstration purposes.

The Basic Rate Interface facilities provide two 64K bit/sec voice and/or data channels and one 16K bit/sec signaling channel over a single station wire.

AT&T is also providing Pacific Bell with its Basic Rate Interface Transmission Extension plug-in units for the trial, which enable a 5ESS switch to provide ISDN Basic Rate Interface services to remote locations via T-1 facilities.

Lockheed's Mathieu said, "ISDN is just one technological option available to us, just as sat-

See page 18

CROSS TALK

BOB WALLACE

ICCC recipe calls for more users

The International Council for Computer Communication (ICCC) recently succeeded in doing what few, if any, U.S. conferences had attempted before by bringing together all groups with a vested interest in Integrated Services Digital Networks to discuss the advanced technology.

The ICCC-ISDN '87 show, unlike other industry conferences, succeeded in attracting an industry coalition of users, state and federal regulators, and members of the investment community. Representatives from several foreign Post, Telegraph and Telephone administrations also attended to discuss key ISDN technological and implementation trends. The attendees added to the usual mix of local and long-distance carriers, customer premises equipment makers and central office switch vendors.

Although the ICCC show featured attendees that represented diverse ISDN interests, the conference was short on users. It was odd that, despite the ICCC's emphasis on the need to close the communication gap between customers, and vendors and carriers, only 11% of the attendees were users.

At least one user, Sherman Murphy, assistant secretary and director of communications technology for The Hartford, voiced displeasure that users were only a small portion of about 300 conference attendees.

Philip Enslow Jr. was one of the group that founded the ICCC, a nonprofit organization formed by members of the computer industry and academic community in 1952. Enslow, a professor with Georgia Institute of Technology's School of Information & Computer Science, said the ICCC wanted the show to focus on how ISDN could be implemented by users. "We didn't want just the technically savvy because ISDN technology has already been adequately explained," Enslow said.

"The financiers, the carriers and customer premises equipment vendors are already talking to one another. But none of them have discussed ISDN with users," Enslow said. "We wanted to bring the senior executives of user companies to the show, the people who make the buying decisions."

State and federal regulators need more contact with users to get a better understanding of how users may implement ISDN and how regulatory action could affect demand for the planned services, he said.

Enslow emphasized the need for users to take the initiative and air their concerns about ISDN. "Users do not yet appreciate the role they can play in influencing the ISDN decisions of carriers, CPE vendors and regulators," he claimed.

Enslow said representatives of federal regulatory bodies, such as the Federal Communications Commission and members of the state regulatory community, which includes all state utility commissions, do not generally attend shows like ICCC-ISDN '87.

"They must understand the complexity of key issues relating to ISDN," he said.

TWO MONTHS AGO, NORTHERN TELECOM QUIETLY CHANGED FOREVER THE WAY TELEPHONE NETWORKS ARE DESIGNED AND BUILT.

ON SEPTEMBER 16, 1987, WE DID THE SAME FOR CORPORATE NETWORKS.

We introduced Meridian Customer Defined Networking.*

Now, enterprises of all sizes can combine private telecommunications facilities, information management systems and public carrier services transparently into hybrid networks of their own.

They're free to configure private branch exchanges, digital Centrex, tandem and packet switching systems, service data bases, applications processors and carrier services in any combination they want.

Simply put, Meridian Customer Defined Networking is freedom of choice and customer control.

It's fully compatible with over 15,000 Meridian SL-1* and SL-100* integrated services networks, DPN packet switching systems, 1,100 DMS* digital switching systems and over one million digital Centrex lines already in service nationwide.

And it's compatible with other vendors' equipment, through industry standard protocols and interfaces.

*Trademark of Northern Telecom © 1987 Northern Telecom

Corporate America is asking for custom hybrid networks, and Northern Telecom is responding as the leading supplier to their systems integrators.

Meridian Customer Defined Networking contains three important innovations:

Meridian Network Services,* applications which include corporate carrier services, advanced calling features, local area networking, conferencing, voice mail and other advanced networking services.

Meridian Network Control,* management tools for network planning and design, operations, administration and diagnostics for hybrid networks. It also interfaces with management and administration data bases offered by other vendors.

And Meridian SuperNode,* a powerful new fault-tolerant network node that gives corporations with large, complex networks the same capabilities we provided to local and interexchange carriers with the introduction last July of DMS SuperNode.*

These innovations, combined with the intelligence of Signaling System 7 protocol for very large networks, ISDN primary and basic rate access, and T1 bandwidth management, will free corporations from the boundaries of traditional network architectures.

Best of all, Meridian Customer Defined Networking is a reality. It's available now.

Meridian Customer Defined Networking exemplifies Northern Telecom's commitment to OPEN World* and open networks.

A quiet commitment to the Intelligent Universe,* where sharing information, anywhere, anytime and in any form, will be as easy as using a phone today.

nt northern telecom

meridian

NETWORKING

▶ *AUTOMATIC CALL DISTRIBUTION*

Aspect enhances tools

BY BOB WALLACE
Senior Editor

SAN JOSE, Calif. — Aspect Telecommunications Corp., a manufacturer of automatic call distributors (ACD), last week introduced system management enhancements to its Aspect Call Center ACD and increased the trunk capacity of two of its current ACD products.

The system enhancements include a resource forecasting software package, the addition of voice storage and retrieval capabilities within the ACD and agent productivity features.

The forecasting software, which runs on the Aspect Call Center, is designed to help users forecast the growth of ACD systems by providing a series of management reports containing system usage data collected by the ACD. It obviates the need for a separate personal computer and custom software to extrapolate system data. The package is available for use on all Aspect Call Center systems beginning Dec. 1, and it costs $15,000.

The Aspect Call Center boasts several agent productivity features, all of which are part of the system upgrade and are available at no charge. One such feature enables the ACD to distribute voice messages automatically to agents when they finish handling other calls. Another feature provides agents access to personal performance statistics, displayed on the screen of their Aspect Telesets.

Aspect also announced single-cabinet versions of its current System 100R and System 200 and boosted the number of trunks they can handle. Known as the System 300 and System 300R, both units are capable of handling up to 320 incoming trunks. The original System 100R supports up to 168 trunks, while the System 200 supports from 200 to 300 trunks. ◻

BOCs widen ISDN trials

continued from page 15

ellites, fiber, microwave and coax are." As with many government contractors, Lockheed has a wide variety of computer and networking equipment that must be reconfigured regularly as contract projects change. Mathieu said he believes ISDN offers a flexible way to tie remote terminals and personal computers into centralized resources.

ISDN can potentially allow Lockheed to move increasingly toward distributed computing by providing personal computer users easy access to a range of host computers, Mathieu said. "ISDN facilitates distributed computing without the requirement for a lot of coax and dedicated cabling that we tend to put in on a point-to-point basis," Mathieu said.

He said he sees ISDN's advantages for computer and terminal users who rely on dial-up lines at speeds of 9.6K bit/sec to 19.2K bit/sec. "You're increasing the throughput," Mathieu said. "The user that wants to dial somewhere else can transfer a file at 64K bit/sec, which is adequate," he said.

Assuming ISDN is priced at 1½ times the cost of regular telephone service, Mathieu estimates he'll realize a 25% reduction over the dedicated-line costs he now pays to support data terminals. The service will also enable employees to access different network resources, he said.

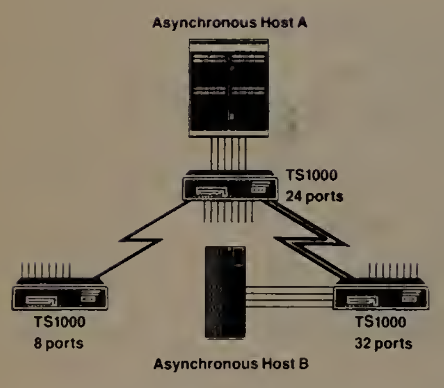
Mathieu said he is looking at ways ISDN can be used to integrate business functions better. One such area is in Lockheed's procurement department, where employees need to use the phone and access data simultaneously. ISDN may help move information faster electronically, thus giving the company a competitive edge, Mathieu said.

Although the trial is Pacific Bell's first step, the company plans to extend the test to San Francisco in January and to San Ramon, Calif., in March 1988. Pacific Bell will install a different switch in each city to test the switches' interworking capabilities.

The San Francisco test will employ an NEC America, Inc. NEAX 61E digital adjunct in conjunction with an analog AT&T 1A ESS. The San Ramon site will use a Northern Telecom, Inc. DMS 100. Approximately 80 ISDN lines will be in use when all three switches are operational.

The Northwestern Bell trial will employ one NEC America NEAX 61E digital central office switch and a pair of NEC America NEAX 61E Adjunct Systems. Control Data, which currently uses 20,000 Centrex lines, will use 60 Basic Rate Interface lines. The adjunct systems will initially provide Basic Rate Interface ISDN service to Control Data's headquarters building. One of the switch adjuncts will be located in the BOC's downtown Minneapolis office, while the other will be installed in Northwestern Bell's Bloomington, Minn., central office. ◻

How a smart mux
can make *you* look smart.



The TS1000 Switching Multiplexer gives you everything you're looking for in a mux: Exceptional cost savings. Link speeds as fast as 64K bps. Channel speeds up to 19.2K bps. Port contention. Multiple links for throughput and redundancy. And exceptional ease of operation thanks to centralized network control functions.

You're also assured a simplified, economical upgrade path based on our building-block strategy.

You'll find that one of the two TS1000 versions can perfectly match your specific requirements.

The TS1000 *single link* version functions as a conventional switching stat mux in point-to-point configurations, supporting 4 to 32 channels and a single composite link. It can also serve as a low-cost end node in larger private data networks.

The *quad-link version* supports 8 to 32 channels and four composite links. Each TS1000 link may connect to one of four different sites, or multiple links may connect to a single site for greater data throughput and added backup.

Simply put, ComDesign's TS1000 is designed to help you invest smart. Work smart. And look smart.

But what makes you look absolutely brilliant are the TS1000's exceptional reliability and unique migration features.

The TS1000 ensures end-to-end integrity with error correction and automatic rerouting in the event of line failure.

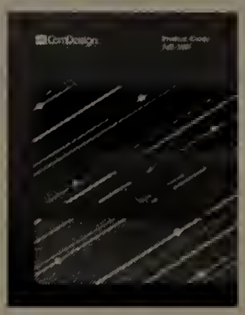
To further maximize uptime, we offer you a full year warranty that guarantees overnight unit replacement with free parts and labor. We also provide optional on-site service for larger networks.

Compatibility with the full range of FutureCom™ family networking products assures a flexible upgrade path from a simple point-to-point mux to a network with hundreds of user connections.

Because of its modular design, TS1000 software and channel capacity upgrades are exceptionally simple and economical. In fact, all ComDesign products offer a migration path that lets you build on your original investment.

Like to know more?

It's all in this
free brochure.



**For a free copy of our brochure,
call 1-800-235-6935.
Ask for Department M11.**

ComDesign
A Network Equipment Technologies Company

26 Castilian Drive, Santa Barbara, CA 93117
(805) 685-1411

Trademark: FutureCom—ComDesign

See us at TCA Booth #904, lower level

LOCAL NETWORKING

> “There are two things to keep in mind about Lotus [Development Corp.] They don't realize how important local nets are, and Lotus [1-2-3] is not a shared product.
>
> **Andy Seybold**
> Chairman
> The Seybold Group, an industry consulting firm
> Santa Clara, Calif.

LAN INDUSTRY

AT&T to sell TCP/IP software

Offers Wollongong's Unix-based tool.

BY MARY PETROSKY
West Coast Correspondent

PALO ALTO, Calif. — The Wollongong Group recently announced that AT&T will be distributing a version of Wollongong's Transmission Control Protocol/Internet Protocol communications software for Unix System V Release 3.1.

The Wollongong software supports a range of Unix System V Release 3 features, including Streams and Remote File Sharing (RFS). Streams provides standard networking hooks, making it easier to implement Unix and Unix applications in a networked environment. RFS allows users to access remote files and peripherals without special commands, making it easier to write distributed applications.

AT&T will sell both source and binary forms of the software for its 3B computers that run Unix System V Release 3.1. AT&T is calling the product the AT&T Enhanced TCP/IP WIN/3B Interface for the AT&T 3B Computer.

Wollongong is also selling the software, which it introduced in early summer and calls Wins/Streams.

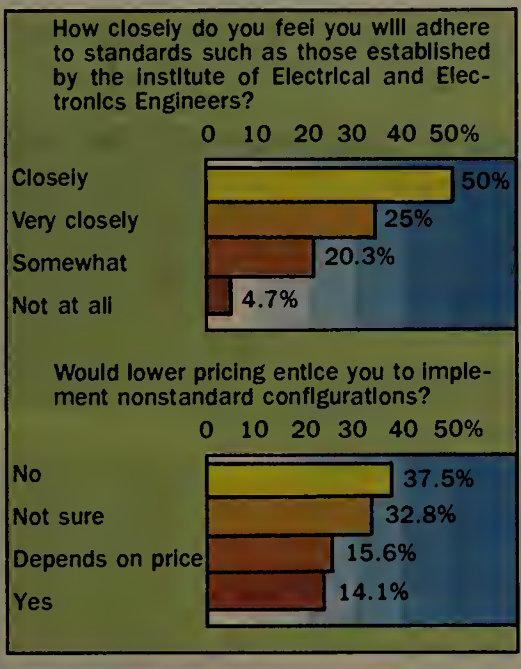
This is the first TCP/IP implementation AT&T has offered for Unix System V Release 3 or higher, according to Dan Ladermann, Wollongong's vice-president of advanced programs. “Now that the networking will be generally available from AT&T, developers and users will be able to take advantage of the enhanced features of Unix,” Ladermann said. “Now we'll see System V Release 3 move forward quickly.”

Wollongong worked closely with AT&T in implementing Streams, Ladermann noted. Prior to the availability of Streams, vendors had to couple Unix tightly with specific network environments, such as Ethernet or IBM's Systems Network Architecture. As a result, users had a limited variety of computers they could hook together because the appropriate network support was not always available with Unix.

Both AT&T's and Wollongong's versions of the TCP/IP software support a range of TCP/IP proto-

See page 20

Users planning to install local nets rate standards adherence and price discount influence on that adherence



LAN ADVANCES

Banyan unwraps 80386 net server

Also cuts prices on existing servers.

BY PAULA MUSICH
Senior Editor

WESTBOROUGH, Mass. — Banyan Systems, Inc. last week announced a high-performance network server based on Intel Corp.'s 80386 microprocessor and announced price reductions of between 7% and 17% on its existing Banyan Network Servers (BNS).

Banyan, which manufactures personal computer network servers that support multiple networking technologies and wide-area links, also unveiled a BNS upgrade kit that turns Banyan's Motorola, Inc. 68000-based server into an Intel 80386-based server with more memory.

The Banyan/Corporate Network Server (CNS), which runs a version of Banyan's Virtual Network System/386 (VINES) network operating system, supports twice the number of users as the existing BNS. Banyan also said the new server is two to three times faster than the BNS.

Banyan officials said the company opted to build a server based on the 80386 for several reasons. The 80386 is a better platform for UNIX, on which VINES is based, than previous Intel microprocessors, according to Fred Chaloux, Banyan director of hardware engineering. It is also faster than the Motorola 68020 microprocessor for some applications, he maintained.

The new server and upgrade kit are intended to demonstrate that Banyan is willing to work with new technology rather than lock customers into technology customers fear will become obsolete.

“It's a promise to our customers that we'll allow them to choose what they want,” said Product Marketing Director Mary Kirson. Whether Banyan will move completely away from Motorola 68000 technology depends on “developments in the market,” Kirson said.

Although Banyan originally demonstrated VINES/386 networking software on a Compaq Computer Corp. Deskpro 386, it built its own server in order to optimize performance for networking.

The CNS operates at 20 MHz and provides up to 24M bytes of memory and up to 1.2G bytes of disk storage. It is available with a 150M-byte tape backup unit. Up to 32K bytes of the server's memory can be used for memory caching to speed loading of instructions to the processor. The BNS/386 upgrade provides up to 628M bytes of internal disk storage.

The new server uses Banyan's existing triple bus architecture, which includes an IBM AT-compatible bus, a high-speed memory bus and a small computer system interface peripherals bus.

The server was also designed to accommodate IBM's Micro Channel bus architecture, although it does not support the Micro Channel bus

See page 21

LANMARKS

PAULA MUSICH

Users are looking for intelligence

Intelligent workstations, whether personal computers or high-performance technical workstations, are becoming the network node of choice, replacing dumb terminals. Driving this trend is an increased need for local processing power and an easier-to-use human interface that allows workers to be more productive.

Thus far, personal computer network vendors have capitalized on the migration to intelligent workstations more than any other vendors in the communications industry.

International Data Corp. (IDC), a communications research firm based in Framingham, Mass., projects that personal computer network installations will grow at about 100% per year for the next couple of years. Around 1991, IDC projects, more personal computer network connections will be shipped than personal computers themselves, as previously installed stand-alone personal computers are linked in ever-increasing numbers.

However, a more subtle force is also fueling this trend: Users are coming to expect that they will be able easily and economically to interconnect their personal computers to other resources within their organizations to access information primarily available only to dumb terminal users now. The implications of this trend for larger systems vendors, especially minicomputer vendors, are enormous.

By recognizing this need and providing users with the access they desire, minicomputer vendors, for example, will be able to reclaim their title as champions of distributed processing.

This title currently belongs to personal computer network vendors because they capitalize on the intelligence in personal computers to distribute information as well as access to that information.

But the information made accessible by personal computer local networks is too limited in its scope. There is a real need for connectivity outside the local work group into the larger processors that contain corporate data.

If the independent networking vendors that prospered by providing the foundation for that need are not willing or quick enough to follow through on the real promise of local

See page 21

▶ *X.WINDOW*

Windowing standard effort gains ground

BY PAULA MUSICH
Senior Editor

CAMBRIDGE, Mass. — An effort led by the Massachusetts Institute of Technology to establish a windowing standard for network environments gained momentum recently with a new release of the X.Window system and announcement of ANSI participation in an X.Window standards-setting push.

Version 11 of the X.Window system for graphical computing, which greatly expands the capabilities of the original version announced in January, will be considered by ANSI as the basis for a future window management standard for networked workstations. X.Window was developed as part of MIT's Project Athena in cooperation with several computer and technical workstation vendors.

A window system allows multiple applications to be displayed on a screen at the same time. Windowing in a network environment enables display of multiple applications running locally and on other processors in the network.

The ANSI Technical Committee on Computer Graphics Standards, X3H3, agreed to have its window management task group research Version 11 of the X.Window as a basis for a future windowing standard. That task group, known as X3H3.6, is now developing a reference model and writing documentation for X.Window to evaluate and clarify X.Window functionality. The task group will make its recommendation to the entire committee at a meeting scheduled for Oct. 5 through 9 in Lowell, Mass.

"It's our understanding that if X.Window gets through the ANSI committee, it has a clear shot to the [International Standards Organization]," said Robert Scheifler, a research associate at MIT's Laboratory for Computer Science. ANSI is the U.S. representative to the ISO.

Scheifler said there is currently no work being done in the ISO that competes with X.Window, and vendors such as Microsoft Corp. and Sun Microsystems, Inc. that have their own windowing systems that operate in networking environments aren't heavily promoting their systems as standards.

IBM has also added support for the X.Window system in its RT Personal Computer engineering/technical workstation running the Advanced Interactive Executive operating system. IBM will upgrade this support to Version 11 of X.Window. Other vendors participating in the X.Window effort include Digital Equipment Corp., Apollo Computer, Inc., Hewlett-Packard Co., Adobe Systems, Inc. and Data General Corp.

Project Athena developed X.Window in a Transmission Control Protocol/Internet Protocol network, but the windowing system is capable of operating over any networking software.

"The network-specific aspects of X.Window are very localized," Scheifler explained. "There are a couple of software modules that need to be changed to work with different networking software." According to Project Athena Director Steven Lerman, no networking vendors have worked with X.Windows thus far.

AT&T to sell TCP/IP software

continued from page 19

cols and applications including: File Transfer Protocol, Telnet, Simple Mail Transfer Protocol and the complete Remote Series Protocols. Wins/Streams also provides programming libraries for the AT&T Transport Level Interface (TLI) and the Berkeley Socket Library. TLI, like Berkeley Socket, is an interface between a user's program and the Unix operating system.

TLI is a standard interface that application developers can write to and, similar to Network Basic I/O System, it can remain isolated from the underlying network protocols. Streams, in turn, provides a mechanism for moving packets of data between protocol layers. This makes it easier to implement different protocols, such as the Department of Defense's TCP/IP and the International Standards Organization (ISO) protocols based on the Open Systems Interconnect (OSI) model, Ladermann said.

By using Streams, Wollongong has been able to implement ISO protocols and an OSI-to-TCP/IP gateway as options to TCP/IP in Wins/Streams.

In a demonstration slated for the Federal Computer Conference in Washington, D.C. from Sept. 29 through Oct. 1, Wollongong will display versions of its WIN/TCP software running TCP/IP and the ISO protocols concurrently under

When connecting different communications systems, it's best to put all your eggs in one basket.

Unix System V Release 3.1.

Wollongong's strategy is to develop software that mixes ISO and TCP/IP protocols so that users of TCP/IP can have a migration path to the ISO protocols, Ladermann said. "It's important for potential ISO users to see there's a path for coexistence," Ladermann said. "Real ISO systems are going to become available between 1995 and 2000, and they're going to have to coexist with TCP/IP systems."

At the upcoming UniForum '88, the international conference of Unix users to be held Feb. 8 through 11, Wollongong plans to demonstrate the ISO transport Class 4 protocol running over the Department of Defense's Internet Protocol, Ladermann said.

NETWORK NOTES

Proteon, Inc. of Westborough, Mass., will resell **The Wollongong Group Inc.'s** Transmission Control Protocol/Internet Protocol software for Digital Equipment Corp. VAX and MicroVAX systems tied to Proteon token-ring networks. Wollongong's WIN/TCP software will operate over Proteon's 10M bit/sec ProNET-10 network and its 80M bit/sec ProNET-80 network. The Wollongong software is compatible with Proteon's existing TCP/IP software, which supports VAX/Unix systems, Sun Microsystems, Inc. workstations, IBM Personal Computers and compatibles, IBM VM/CMS systems and Proteon's Terminal Interface Units.

Advanced Micro Devices, Inc. of Sunnyvale, Calif., developed what it says is the first chip set to implement the American National Standards Institute's Fiber Distributed Data Interface (FDDI) standard. The FDDI standard calls for 100M bit/sec data rates using a timed token-ring access method and ring topology over optical fiber.

The standard is currently implemented in commercial offerings using six integrated circuit boards that cost some $30,000, officials from Advanced Micro Devices said. They said the company's five-chip set, priced at $625, will decrease the cost of fiber nets.

Banyan unwraps 80386 net server

continued from page 19

now. "We're evaluating whether it will be a legal thing to do," Kirson said.

The IBM Personal Computer AT-compatible bus can accept up to four different network interface cards, including Ethernet, token ring and Arcnet adapters.

The CNS server and BNS/386 upgrade kit will be available in April 1988. A base configuration of the server — including 4M bytes of memory, an 80M-byte disk, a 150M-byte tape drive, internal battery backup, VINES software, software to support one local network and documentation — will be priced at $21,995.

The upgrade kit will include an 80386-based motherboard, 4M bytes of memory, a backplane, an upgrade software tape and documentation. It will be priced at $6,125, plus a special labor charge for factory installation, which is required.

The charge, although it has not yet been established, will be less than $1,000, according to Kirson.

BNS price discounts are effective Oct. 1 and increase with the server's disk size and memory configuration. The price for BNS Model SA 112 will be cut from $16,245 to $15,095. The price for BNS Model 144 will be cut from $25,245 to $20,995.

Banyan also plans to support the IBM Personal System/2 Model 80 as a server but has not set a date for that support.

Users looking for intelligence

continued from page 19

networking technology, others will fill the gap.

One firm trying to meet the need for wider connectivity is Banyan Systems, Inc.

Although it was somewhat late in entering the local net market, it is now winning greater acceptance because it excels where others falter: Its products provide better wide-area network links, and they more tightly interconnect to larger systems.

Banyan has the right combination of features in its servers at the right time. But that advantage may not last long as competitors race to catch up.

This is where the larger systems vendors should pick up where they left off. Although they originated the concept of distributed processing, they failed to take it far enough by refusing to recognize the personal computer as an intelligent device.

Although some changes are taking place that allow the personal computer to act as a peer to larger processors in a network, not all vendors have recognized this market requirement.

As long as minicomputer vendors continue to treat personal computers as second-class network citizens, they will lose ground to personal computer networks.

AT&T's Premises Distribution System: Making it easy to make all the right connections.

Once, setting up the right office communications system was simple—you'd have the phones installed.

Today's office environment is far more complex, requiring a variety of communications products, often from a variety of vendors. Each supported by a wiring scheme designed for it alone. Making the process of expanding and integrating your network a complicated one.

Well, now AT&T can make installing, expanding, and integrating your communications systems simple again. By putting all your communication eggs back into a single basket. With the AT&T Premises Distribution System (PDS).

A lot to take advantage of. PDS allows you to support your communications products on a single wiring system. A wiring system which incorporates every necessary element—from the cabling plan to the system administration products.

All of which results in a number of distinct advantages.

The advantage of accountability—PDS is backed by a firm AT&T commitment to provide connectivity with virtually every major vendor's equipment, including our own.

The advantage of flexibility—PDS makes it easy to use the best product for different functions. You're not locked into a single vendor's technology. And PDS will support voice and data transmission, as well as image, digitized video, and other forms of communication.

The advantage of expandability—PDS allows users to connect equipment through universal jacks that fit standard wall outlets.

The "AT&T" advantage. PDS is backed by a comprehensive range of consulting, design, engineering, and service support to ensure the system meets current and future communications needs. Our Application Assurance Program is a commitment that your PDS will support certified applications for a full five years.

So give us a call at 1 800 372-2447, or mail the coupon, or contact your authorized PDS distributor. If you've got questions about connecting your communications products, we've got a basket full of answers.

© 1987 AT&T

AT&T Network Systems, NW 9/28/87
P.O. Box 1278, Morristown, NJ 07960-1278.
Please send me more information about the AT&T Premises Distribution System.
Name ____
Title ____
Company ____
Address ____
City ____ State ____ Zip ____
Phone ( )

AT&T's PDS is a comprehensive system of basic components, from inside wire (both copper and fiber), to electronic apparatus and support services.

AT&T
The right choice.

Amdahl introduces a prince of a communications processor.

Our new 4725 builds on the strengths of its 4705 predecessors—installed around the world—to give you a uniquely cost-effective way to boost your network's performance.

The 4725 runs 3725 ACF/NCP software, and delivers a throughput capability that's significantly higher than its only rival's.

So you can do what you tell us you need to do: run more lines at higher speeds.

Reconfiguring's a snap.

You can add capability quickly—often without having to order, and wait for, parts. We understand that your traffic can't wait.

It's compatible.

The 4725 works with many other vendors' equipment, so you can "mix and match" and protect previous investments. We also understand your economic realities.

It's supported by people who know your business.

Experience is the best teacher, and we've learned a lot in the eight years we've invested in developing communications processors.

We understand your needs and concerns, and we know how to anticipate and respond to them. We can make things easier for you.

More productivity for your money.

That's our new 4725's ultimate value to you, and no other communications processor can match it. Call your local Amdahl representative for details.

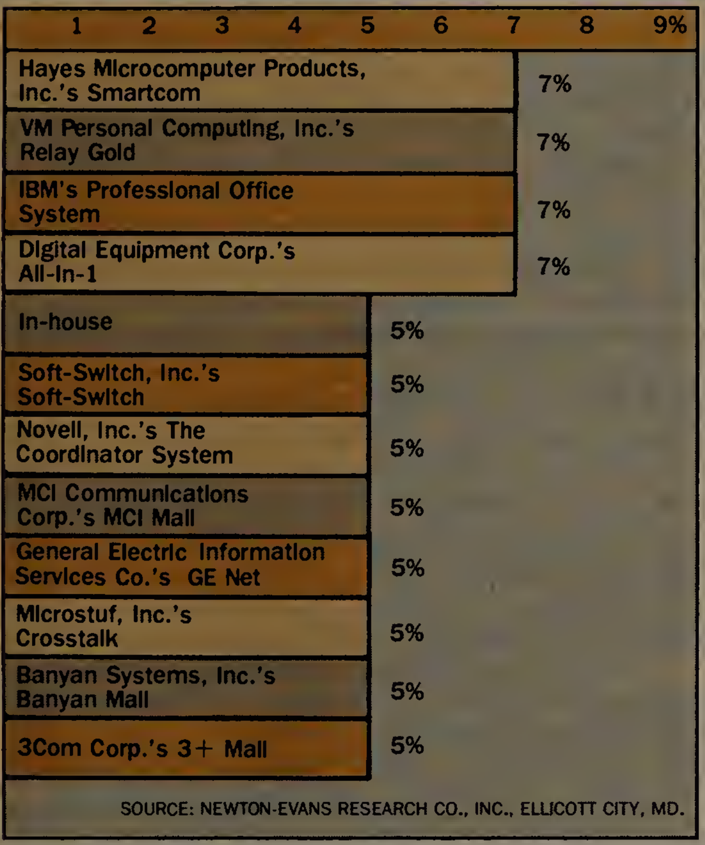
amdahl

The VALUE Choice

DATA DELIVERY/ NET MANAGEMENT

> “People have a Buck Rogers view of network management, with one person sitting at a console and monitoring a company’s network and data center operations. That is a great view, but I don’t think it will be achieved in my professional lifetime.
>
> **Bruce Fadem**
> Senior vice-president
> Bank of America
> National Trust & Savings Association
> Concord, Calif.

Personal computer software used for electronic mail in Fortune 1,000 companies



SOURCE: NEWTON-EVANS RESEARCH CO., INC., ELLICOTT CITY, MD.

NETWORK MANAGEMENT

Early users give thumbs up to Peregrine system

Despite shortcomings, laud PNMS tool’s flexibility.

BY PAUL KORZENIOWSKI
Senior Editor

Early users of network management software from Peregrine Systems, Inc. say the product helps them track problems, manage inventory and allocate resources better.

The Peregrine Network Management System (PNMS), manufactured by the Irvine, Calif.-based firm, consists of four software modules that run on an IBM mainframe under the MVS operating system.

These modules include one for problem management, which is used to log items that may have a negative effect on an end user, such as slow response time. The others include change, inventory and configuration, and financial management. The change management module is used to control alterations to the network and helps to alleviate problems caused by adding and deleting network resources. The inventory and configuration management module enables customers to keep tabs on network equipment and how it is connected. The last module, financial management, stores contract information such as customer invoices.

The modules store information in a relational data base, and customers can use a report writer and format manager to glean information from the data base. For example, the problem management module can produce a report that will list all the users complaining of slow response time.

Charlie Hoffman, manager of programming support services at the Public Service Co. of Indiana, Inc. in Plainfield, Ind., said the electric utility used IBM’s Account Network Manage-

See page 24

INTERNATIONAL

Worldwide NASA data net sustains break-in

W. German hackers foil VMS security.

BY JOSH GONZE
Staff Writer

West German computer hobbyists broke into an international data network of the National Aeronautics and Space Administration this summer and inspected unclassified research data, according to news reports confirmed by NASA.

Before voluntarily publicizing their accomplishments last week, the hackers installed a Trojan horse program on some of the Digital Equipment Corp. VAX computers in the network that enabled them to bypass security procedures at any time, the reports said.

“Trojan horse” is a programmer’s term for code permanently placed in a larger program that affords easy access to hackers.

In Washington, D.C., NASA officials said the network break-ins took place in August, but they would not comment on the identity of the hackers.

“We picked up three unauthorized entries in early August and took the necessary security precautions in our system,” said spokesman William Marshall Jr. “We traced the entries back to West Germany but cannot confirm or deny that they originated in West Germany. They could have looped through the system. They could have originated back here in the U.S. for all we know,” he said.

According to Douglas Hunt, manager of the computer security program at NASA, the hackers first obtained access via a security gap in the VMS operating system. DEC has since patched the gap with a mandatory upgrade, he said.

“The problem came from a known hole in VAX/VMS,” Hunt said. “When DEC sent out the patch to plug the hole, it also published a newsletter detailing the nature of the problem.

“Apparently, these entries were made prior to the installation of the DEC upgrade,” he continued, “and there was a Trojan horse installed in one of the system programs that, had it not been identified, would have given them continued access.”

A DEC spokesman, Jeff Gibson, said the upgrades were installed between May 1987 and July 1987, and he said the new VMS release, Version 4.6, incorporates the modification.

However, Gibson said, blame for the break-in should fall mainly to

See page 24

DATA DIALOGUE

THOMAS A. POLIZZI

NetView: a de facto net management standard?

Multivendor networks composed of a variety of equipment are becoming commonplace. Protocol converters, various interface and access support systems, gateways and bridges enable users to connect various vendors’ communications equipment.

Unfortunately, comparable network management tools have not yet evolved. There are no tools to connect the pieces of each vendor’s network management subsystems. Since there is no way to connect individual management subsystems, there is no single network point capable of managing all network elements.

Despite this limitation, users have been able to manage their networks by using a variety of operator consoles. However, as the types of equipment have increased, the number of consoles needed to control the network have escalated from fewer than 10 to 40 or more in many corporations. Another problem results from users’ efforts to combine their networks and share facilities, such as T-1 lines.

With some of the more advanced integrated digital networks, network operators are being forced to make seat-of-the-pants decisions on critical matters. These network operators need to be highly trained in order to recognize every idiosyncrasy of each vendor’s management system. They also must be adept at deducing the real problem from confusing alarm and alert signals. For network operators, the network management situation is rapidly changing from one of mere discomfort to one so precarious that it borders on being uncontrollable.

Pragmatically, there is only one way to diffuse this situation. The tools that provide connectivity between different vendor equipment must be used to exchange management information. Network management subsystem protocol converters must be developed. Additional-

See page 24

Polizzi is vice-president of Communications Solutions, Inc., a consulting and software firm in San Jose, Calif.

NetView: a de facto standard?

continued from page 23

ly, there needs to be a single central point that can intelligently handle information from these subsystems. An existing management system needs to assume the role of leader and take on the task of intelligently handling the information.

IBM's repackaged network management system, NetView, is emerging as the product capable of managing all equipment on a network. NetView is the likely candidate for many reasons. Within a Systems Network Architecture network, NetView already manages almost all of the attached IBM equipment.

Also, IBM has provided the basis for a standardized interface between NetView and other vendor management systems. This interface is NetView/PC, IBM-supplied software running on an IBM Personal Computer. The standard interface provides non-IBM vendors with a platform for adding companion software that will transform non-IBM network management system information into an IBM format.

Another NetView advantage is that IBM network management tools are used on three out of every four worldwide networks. Therefore, the underlying screen formats and command structure are known by a large body of operations personnel. Even though the product's command structure currently does not support non-IBM equipment adequately, it is a very acceptable basis for establishing a standard, vendor-independent command structure and screen display protocol.

The final argument for NetView is pragmatic. What users and vendors of SNA-based networks need is not another network management alternative but a de facto standard. By limiting the option to one such system, savvy vendors can design their new products to work within a de facto system. Focusing on such a system promises to be the fastest path toward establishing network management standards.

NetView has limitations. In order to succeed, NetView must supply effective communications with all other management subsystems. The NetView/PC interface is far from ideal, and NetView's ability to work with the transmitted information is, at the moment, primitive. Yet it offers the basis for evolving toward a single point of intelligence, a point capable of managing a complex integrated network equipped with vendor equipment and carrier services.

NetView and NetView/PC detractors point to NetView's ability to manage an SNA device more effectively than a non-IBM device. But, as NetView evolves, these distinctions will become blurred, and other vendors' equipment will receive better support. If not, users will seek another leader for the network management master.

IBM has a lot to lose if NetView does not emerge as an industry standard. The data processing-based solution toward network management may be usurped by a carrier-based solution. While many expect that a carrier-based solution will ultimately be the best long-term solution, few expect such a system to be available soon. If NetView fails to gain immediate support, carriers could be encouraged to accelerate their development plans.

For the typical non-IBM vendor, providing network management system information to a carrier-based solution will prove more complex and more costly than a DP-based solution. Thus, a case can be made for all vendors to support NetView actively as the basis for controlling a mixed vendor network.

Approximately 10 equipment vendors are expected to demonstrate support for NetView by passing alerts for their respective subsystems to NetView via NetView/PC at the Tele-Communications Association show this week in San Diego.

Connectivity for information flow between multivendor equipment is here. Management of these networks now needs to be addressed. NetView provides the basis for such management, but it is not clear how quickly NetView can evolve and whether it will emerge as a de facto standard.

Worldwide NASA net break-in

continued from page 23

users of the NASA network who showed VMS operating manuals to hackers outside the agency. The manuals included default passwords, he said.

When the break-in was detected, NASA immediately began stopgap solutions "like turning off access completely once we had identified where [the break-in] had come from," Hunt said.

"At one point, they were even requiring operator intervention to complete a connection," Hunt added.

NASA would not provide details about the defiled computer system, called the Space Physics Analysis Network, except to say it is a worldwide network provided for authorized users at universities and research institutions.

Peregrine gets thumbs up

continued from page 23

ment Program to manage its IBM Systems Network Architecture network resources. "The IBM product was good during its time, but it is a batch-oriented program, and we needed an on-line package," he noted.

Last fall, the electric utility company formed an evaluation team with employees from systems development, systems software, data center operations, telecommunications and mobile radio and telephone departments. After an initial evaluation, the company narrowed its choices to Peregrine's PNMS and California Software, Inc.'s NetMan. Other products were eliminated because they lacked data network management capabilities, could not be easily tailored or were expensive.

The next step in the evaluation process involved talking to three users of each vendor's product and visiting both vendors. "We wanted to see if either company was just a start-up operation run out of a garage," Hoffman said.

PNMS offered an application generator that resembled a fourth-generation language, a feature that would enable the electric utility to tailor the product — a plus that swayed the sale to Peregrine.

In August, the electric utility installed the software without any major hitches. Hoffman said the chief benefit of the software is that it helps the company allocate resources. "If we log 100 problems, and 50 are in one area, then we know we have to apply more resources to that area," he said.

Hoffman has been satisfied with PNMS but cited a few shortcomings. He said the product's documentation was not very good. Also, the change management module brings up the first, rather than the last, problem encountered.

Champion International Corp., a paper company in Hamilton, Ohio, also turned to PNMS after finding its homegrown network management package lacked needed flexibility, according to Larry Rose, manager of customer support representatives. Champion chose PNMS because it was more flexible than other products evaluated.

Champion installed PNMS in December without incident. The company initially used the plain vanilla version of the problem management module for a few weeks to track network problems reported to the data center.

But Champion later began customizing the product to meet its specific needs. Champion started with simple changes, such as tweaking the product's report-generation capabilities and altering a few screens, and later moved on to more difficult tasks, such as designing an on-line analysis tool that supplies managers with a snapshot of the previous week's activities. "There hasn't been anything we wanted to add to the product that we weren't able to," he said.

Although Rose is a satisfied customer, he noted a few limitations. He seconded Hoffman's problem with documentation and said PNMS eats up system resources.

3270 MICRO-MAINFRAME Sync-Up™ 3780

Emulation Software and Modem on One Board

DataSYNC 3270 and DataSync 3780 combine Winterhalter's DataTalker emulation software with the UDS Sync-Up modem boards (201C, 208A/B).

DataSYNC 3270
- Auto Dial/Auto Answer
- File Transfer
- 12 Sessions
- Application Program Interface (API)
- Hot Key
- $1595 for 2400 bps (201C)

DataSYNC 3780
- Auto Dial/Auto Answer
- Application Program Interface (API)
- $1095 for 2400 bps (201C)

If you want IBM 3270 or 3780 emulation on one low-cost, high performance communications board — call us today at 313/662-2002.

Also, ask about our 8 PC 3270 Cluster Controller for $2395.

WINTERHALTER
INCORPORATED
3796 Plaza Drive • Ann Arbor, MI 48104

Application Program Interface

Sync-Up™ is a trademark of Universal Data Systems.

COMMUNICATIONS MANAGER

> “If you pay peanuts, you get monkeys.
>
> **Jim Wells**
> MIS manager
> Gorham precious metal manufacturing division
> Textron, Inc.
> Commenting on problems managers encounter when trying to hire experienced communications staffers.

PRIVATE BRANCH EXCHANGES

Disaster recovery can be manageable

Understand the company’s needs, experts stress.

BY JOSH GONZE
Staff Writer

Whether the cost of private branch exchange downtime is measured in terms of dollars or damage to corporate image, the need for telecommunications disaster recovery plans is becoming more critical due to the increasing use of the telephone as a strategic business tool.

To develop a disaster recovery plan, communications managers must first deduce how critical the PBX is to their company’s business, according to several consultants interviewed recently.

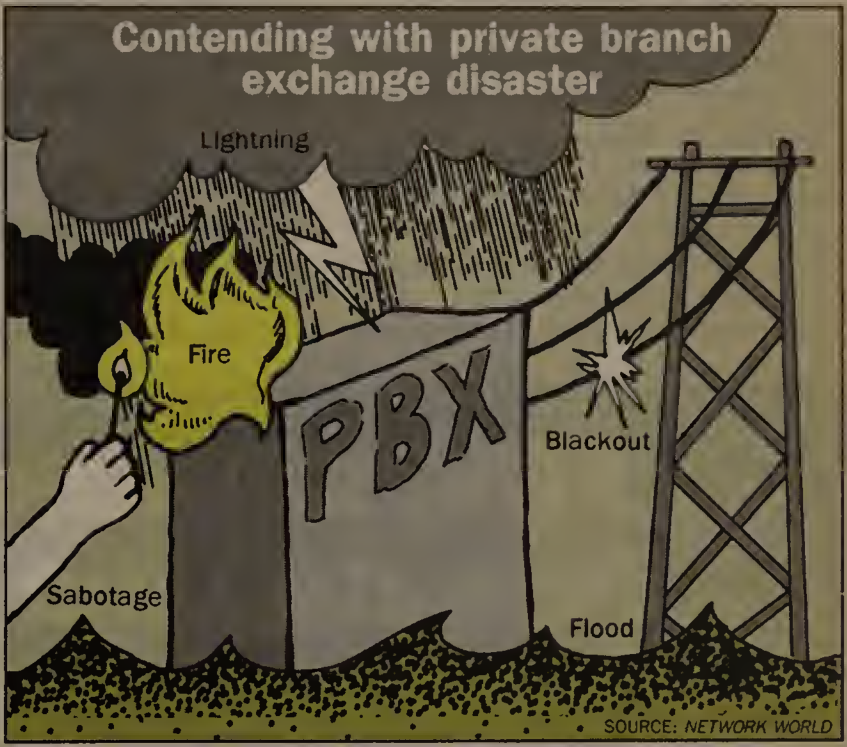
“Network managers have to do their homework to determine what the needs are for each department and what the impact of losing telephone service would be,” said Paul Daubitz, president of ATI Telemanagement, Inc., a telecommunications consulting firm based in Newburyport, Mass.

The consultants generally agreed that planning for recovery from PBX disasters has become more important because the telephone is increasingly used as a strategic tool of doing business. “Historically, DP has been much further ahead of telecommunications in sophistication of disaster recovery plans. But that’s changing because telecommunications is becoming mission-critical,” said Ben Occhiogrosso, vice-president at DVI Communications, Inc., a Manhattan-based consulting firm.

When the time comes to pitch a PBX disaster recovery plan to senior management, information on the cost of downtime will be crucial, the consultants agreed. “You have to talk in the business parlance: ‘What is the impact [of telephone downtime] on the firm? Can we afford to be without this for a prolonged time?’ ” Occhiogrosso said. “When a switch goes down on Wall Street, people lose their jobs. So, to some extent, it’s a matter of survival.”

Estimating the costs of downtime can be done quantitatively for certain

See page 26


Contending with private branch exchange disaster
Lightning
Fire
PBX
Blackout
Sabotage
Flood

SOURCE: *NETWORK WORLD*

GUIDELINES

ERIC SCHMALL

The dismal science 101

Communications managers in many organizations pay for their operations by acting as a utility and charging expenses back to end users. Some managers have the additional responsibility of.operating at a profit.

Faced with these situations, managers begin to look for ways to influence user behavior through incentives designed to reduce peak-hour overloads and to spread demand into areas in which the system is underused.

But often a manager’s first attempt at being an econometrician will end in frustration because communications services are inelastic.

Simply stated, elasticity of demand is the responsiveness of demand to price change. One assumes that if the price of a service rises, the consumer will cut back on usage. But to what extent will usage be curtailed as a result of the price increase? That relationship is what elasticity is all about.

Would-be Alan Greenspans cannot simply announce price hikes for certain services or time periods for which they wish to discourage usage and then expect users to flock to less expensive alternatives. Unfortunately, it is not a matter of simply manipulating the price levers and letting the invisible hand of supply and demand work its magic.

It’s not for nothing that economics is called the dismal science. The interaction of supply and demand is complex, and simply adjusting the price of a commodity will not necessarily evoke the desired consumer response. One must understand the demand elasticity of a product.

Elasticity can be measured by dividing the percentage of change in demand by the percentage of change in price. For instance, the communications manager could raise the cost of toll calls during busy hours by 50% but find that demand only drops by 10%.

The resulting number, 10/50, is less than one. Any coefficient of less than one represents an inelastic demand, meaning users will not cut back very much in demand despite significant price increases.

Suppose, however, the communications manager decided to raise the monthly charge for station lines by 20% and demand falls off 40%. The resultant coefficient is greater than one, representing elastic demand, which means that users will drastically cut back demand despite a relatively small price increase.

Communications services are inelastic because there are no simple alternatives to their use, and the rebilled charges do not represent a significant part of the user’s budget.

Users have become so dependent on telecommunications services that rate hikes are unlikely to cause any significant demand reductions. Users are not going to put down their phones and pick up their pens just because of an internally generated rate increase.

While no manager or executive likes to see an increased bill from the communications department, they are not going to lose sleep over an internal price hike. The charges will generally represent a small part of their overall operating expenses. In addition, the internal transfer of funds — often derisively

See page 26

Schmall is network systems manager for an insurance holding company.

ASSOCIATIONS

The **International Communications Association** will hold a professional development seminar called “Users Strategies for Implementing Telecommunications in Uncertain Times” at the Sheraton Park Central Hotel in Dallas on Nov. 4-5.

The **Tennessee Telecommunications Users Association (TTUA)** has selected Andy Booker, telecommunications director at Vanderbilt University in Nashville, as its telecommunications professional of the year. Booker, a four-year veteran at Vanderbilt, has worked in telecommunications for 11 years.

The TTUA also announced its elected officers for the upcoming year. Tom Stovall, corporate office manager at Dixie Yarns, Inc. in Chattanooga, Tenn., was elected president. Mike Jackson, telecommunications manager of Third National Bank in Nashville, was elected vice-president. Brenda Weaver, telecommunications manager at Ingram Distribution Group, Inc. in Nashville, was elected treasurer. Cindy Fielder, support service specialist for the Internal Revenue Service in Nashville, was elected secretary. Susan Fisher, telecommunications manager at Chattanooga’s Erlanger Medical Center, was elected director of regulatory and vendor liaison, and Bill Bevans, communications manager at Raytheon Co. in Bristol, Tenn., was elected director of membership.

Recovery can be manageable

continued from page 25

types of businesses, but for others, the cost is qualitative and involves the PBX manager's judgment. "In the abstract, it's very difficult to quantify what downtime loss is to a firm," Occhiogrosso said. "In particular vertical markets, we've been successful in doing that."

Telemarketing, airline reservation services and newspaper classified advertising are examples of businesses that can quantify downtime costs. For those applications, users can calculate revenue per call and calls per hour, and from those figures derive revenue lost from downtime.

But businesses can sustain indirect losses calculated in what Occhiogrosso calls "soft dollars."

"The ability to make station-to-station calls, for example, doesn't directly affect customers but does influence productivity," Occhiogrosso said. A company's image also can be harmed by a PBX failure, Daubitz said.

But knowing the costs of downtime is only one side of the disaster recovery coin, the consultants said. The other side is knowing the types of disasters that can befall a PBX and the methods of recovery.

When arguing the case for PBX disaster recovery plans, communications managers should be able to show the trade-off between the cost of downtime and the cost of backup facilities, the consultants concurred.

Edward Horrell, president of Memphis-based Econocom Telecommunications Corp., an equipment dealer and leaser, draws a distinction between PBX downtime and PBX disasters. Downtime is short-term and typically caused by a power outage. Disasters, he said, can last for several days and are typically caused by natural disasters or sabotage.

To protect against short-term power outages, the consultants unanimously agreed with Horrell's recommendation of using batteries to provide an uninterruptible power supply. But, depending on how critical the application is, users can go far beyond batteries to protect against power outage.

Lemuel Tate is executive director and chief operating officer of NTS Telecommunications Service, Inc., which provides the communications services for Northwestern University and a large hospital complex near Chicago. It also provides backup communications for the Chicago Fire Department. "We probably have in place one of the most sophisticated backup systems in the U.S.," Tate said.

The company's first line of defense against power outages is redundant commercial power: electricity supplied by two different distribution plants. If both plants fail to generate power, Tate said, his network relies on diesel generators located near his Northern Telecom, Inc. Meridian SL-100. And, if the generators fail, the PBX has eight hours of battery power.

The switch itself can be lost to sabotage, natural disasters or air-conditioning failures. Keeping a hot standby on another site provides the best insurance, but at a heavy price. "In most cases, the quickest fix is a different box. The bad news is, that fix is going to cost you about what you paid for your first box," Horrell said.

NTS Telecom's Tate keeps a Northern Telecom SL-1N on a separate site. The switch is capable of supporting up to 600 of the most essential voice nodes on the hospital and university network. Occhiogrosso suggests using key systems as backup switches for essential circuits.

In the event that line cards and memory packs burn out or otherwise malfunction, users should keep spares on site, the consultants recommended.

Besides the switch itself, users should plan for cabling disasters, Occhiogrosso suggested. "Users should keep accurate cabling records and wire some people to a backup main distribution frame (MDF). Installing a new MDF after a disaster is very time-consuming and, without accurate records, may be impossible," he said. ☑

The dismal science 101

continued from page 25

referred to as "funny money" — is not taken as seriously as expenses, which represent outflow from the organization.

Given their service's propensity toward inelasticity, communications managers have to recognize that if they are going to affect user behavior, their price hikes will have to be significant, and even then user demand will not drop significantly.

Instead, the communications manager will have to offer service alternatives to users. A good example would be offering electronic mail as an alternative to voice traffic.

Thinking in these terms will help communications professionals exert economic control over how much use their facilities receive. ☑

FMC Wanted a Better Private Line Network.

"LDX NET had the Solution."

"Right from the start LDX NET proved what they could do, and they continue to perform remarkably well," reports Bob Mhoon, Manager – Engineering Telecommunications for FMC Corporation, a Fortune 200 Company, and one of the world's leading producers of machinery and chemicals for industry, agriculture and government.

"When your group is responsible for what ours is, you're looking for more than just a vendor relationship. We were looking for a real partnership, and we found it with LDX NET. My group provides corporate telecommunications services to all FMC operating groups internally, from our host data center here in Dallas, and believe me, we get the personal attention and responsiveness we need from LDX NET," said Mr. Mhoon.

As more businesses like FMC are recognizing how managing communications affects their whole company, they're talking to LDX NET. That's because our only business is providing private line services — the key to the integration of voice, data and video telecommunications. And we do it through our own coast to coast network and the most sophisticated means available — fiber optic technology.

"There's a real feeling of mutual trust with LDX NET. In our experience their service and product is unparalled for reliability. For example, since we installed our LDX NET circuits our error rate has been substantially reduced."

How would Bob Mhoon summarize his relationship with LDX NET? *"Simple,"* he said. *"LDX NET said 'try us.' We did, and it worked. It's a real pleasure doing business with LDX NET."*

If you're looking for real solutions for your private line network, talk to the people who are the private line specialists — LDX NET.

LDX NET
America's Private Line Specialist

15450 South Outer Forty Road / Chesterfield, Missouri 63017 / (314) 537-8000
VISIT BOOTH AT TCA...

NEW PRODUCTS AND SERVICES

See inside for:
▶Higgins E-Mail for remote users
▶AT&T Mail's X.400 gateway
▶PS/2-to-System 3/X boards

E-MAIL INTERCHANGE

Soft-Switch supports VM

Eases message exchange between 9370, other computers.

BY JIM BROWN
New Products Editor

BOSTON — In a move analysts say solidifies its lead in the electronic-mail interchange market, Soft-Switch, Inc. recently introduced software enabling IBM VM-based computers, including the new 9370, to exchange E-mail with dissimilar computers.

The new VM-based software is designed to perform the same functions as the firm's existing MVS-based software.

Both the VM- and MVS-based packages facilitate the exchange of E-mail, documents and binary files among users of E-mail products, including IBM's DISOSS, Professional Office System (PROFS), Personal Services/36, Personal Services/38 and 5520; Digital Equipment Corp.'s All-In-1 and VMSmail; Wang Laboratories, Inc.'s Office and Mailway; MCI Communications Corp.'s MCI Mail; Novell, Inc.'s The Coordinator and 3Com Corp.'s 3+ Mail.

The firm also released software enabling Hewlett-Packard Co.'s HP Desk E-mail to exchange messages with other systems.

Message routing offered

The new Soft-Switch Central/VM package provides message routing, network directory and document-translation services. Messages can be routed to Soft-Switch Central/VM from non-IBM E-mail systems outfitted with one of Soft-Switch's Mailbridge server packages.

A Document Interchange Unit Assembler/Dissassembler (DAD) Gateway, supplied as a standard feature of Soft-Switch Central/VM, converts each vendor's E-mail addressing format to a Soft-Switch format and forwards the message to the receiving system.

At the receiving end, Soft-Switch Central/VM converts the E-mail message or document to the format the receiving system expects, while the DAD Gateway converts the Soft-Switch addressing format to the format that the receiving Mailbridge Server is expecting.

Several Soft-Switch Central/VM packages can be linked via IBM's Systems Network Architecture using the firm's Systems Network Architecture Distribution Services (SNADS) Gateway/VM.

In addition to the DAD Gateway to Mailbridge Servers, messages can also be routed to users of IBM PROFS via Soft-Switch's PROFS Gateway/VM and to users of Wang Mailway via a Mailway Gateway/VM.

Analysts say the new software will enable Soft-Switch customers to free up the MVS-based corporate mainframe from the power-consuming task of converting E-mail document formats by making it possible to implement an E-mail interchange system on a less expensive IBM 9370.

"Instead of having Soft-Switch software on an MVS mainframe, users can install it on a smaller, more cost-effective box," said David Terrie, editor of "Patty Seybold's Network Monitor" newsletter and a consultant with NewPort Consulting, based in Scituate, Mass.

According to George Newman, an analyst with Framingham, Mass.-based International Data Corp., the new software competes with DEC's recently enhanced VAX-resident Mailbus, which links All-In-1 with various E-mail systems, including IBM's SNADS and DISOSS ("DEC struts stuff at DEC-World '87," *NW*, Sept. 14).

Pricing

License fees for Soft-Switch VM-based software ranges from $21,600 to $250,000.

Soft-Switch is located at 955 Chesterbrook Blvd., Wayne, Pa. 19087, or call (215) 640-9600.

UNGERMANN-BASS

UB's Net/Scope tracks local net data traffic

BY MARY PETROSKY
West Coast Correspondent

SANTA CLARA, Calif. — Ungermann-Bass, Inc. recently expanded its network management product line with the introduction of Net/Scope, a package designed to track data traffic on Ethernet and 802.3-based local networks and Ungermann-Bass' Net/One networks based on broadband, baseband or fiber-optic cabling.

Net/Scope, software and a network interface card for IBM Personal Computers, XTs, ATs or compatibles, can be used to diagnose network problems and analyze network performance. It is the first Ungermann-Bass network management product that can monitor traffic on the network itself, according to Stayton D. Addison Jr., product line manager for network management products.

Ungermann-Bass' existing network management products, the Net/One Network Management Console and the Net/One Network Control Console, are designed to monitor and control Ungermann-Bass network interface units, Addison said. Since Net/Scope monitors network traffic, users can now track non-Ungermann-Bass devices on Net/One networks. Net/Scope displays portions of data packets, including the source and destination addresses.

Net/Scope currently supports two sets of protocols: Xerox Corp.'s Xerox Network Systems and Transmission Control Protocol/Internet Protocol.

Net/Scope's features include the ability to store packets for later review and the ability to create a program to watch for a specific network event. An alert feature will notify the network manager of network errors immediately.

The baseband version of Net/Scope is priced at $7,500, and the broadband version costs $8,150.

Ungermann-Bass is located at 2560 Mission College Blvd., Santa Clara, Calif. 95050, or call (408) 496-0111.

PRECISION STANDARD TIME

System synchronizes VAX clocks

BY JIM BROWN
New Products Editor

FREMONT, Calif. — Precision Standard Time, Inc. (PSTI) recently announced a device that synchronizes system clocks of networked Digital Equipment Corp. VAX minicomputers with the Coordinated Universal Time (UTC) standard.

The firm's VAX Time Source ensures that data files exchanged between VAX systems in a VAX Cluster or network of VAXes have time stamps conforming to the UTC as broadcast by the U.S. National Bureau of Standards (NBS).

Time synchronization is important in applications such as securities dealing, where an erroneous system clock setting could halt a transaction before or after the securities exchange closed for the day.

The NBS broadcasts UTC time signals over nine different frequencies from powerful radio transmitters in Colorado and Hawaii.

VAX Time Source scans five of those nine frequencies and locks in on the one producing the clearest signal, as opposed to locking on the one producing the strongest signal.

The device compares the time signal it has locked onto with signals received from other frequencies to ensure no more than a 10-msec difference between any of the time signals.

VAX Time Source links via an RS-232 to any VAX, which then acts as a time server. The UTC time is sent to that VAX asynchronously at 9.6K bit/sec. PSTI software residing on each networked VAX compares the time on that VAX's internal system clock to VAX Time Source.

If the VAX system clock loses synchronization with VAX Time Source by a user-defined time increment, the software sends an alarm to the VAX's operator or automatically resets that VAX's clock.

VAX Time Source features a 72-hour battery back-up power module.

Pricing

VAX Time Source is sold through distributors and suppliers and carries a suggested retail price of $1,495.

Precision Standard Time is located at 105 Fourier Ave., Fremont, Calif. 94539, or call (415) 656-4447.

First Look

Package lets remote users exchange Higgins E-mail

Conetic Systems, Inc. enhanced its electronic mail package for local-area networks and released software enabling remote users to exchange E-mail messages with central site users.

Higgins software, which offers calendar and project tracking functions in addition to E-mail, runs under most local net operating systems. The new version carries a revamped pricing scheme, omits copy protection and offers new E-mail distribution list features.

The new **Higgins Remote** software runs on IBM Personal Computers outfitted with a 2M-byte hard disk and a Hayes Microcomputer Products, Inc.-compatible modem. It enables remote users to send and receive Higgins E-mail via a Higgins Exchange gateway at the central site. The program also provides calendaring functions, a document filing and retrieval system, and a relational data base for moving information among the different functions.

The new package enables up to five users sharing a single personal computer to keep separate files. Files can be either shared or kept private with password protection and encryption.

Higgins Remote is priced at $395. A 20-user version of Higgins is priced at $995. An expansion kit supporting an unlimited number of users on the same local-area net costs $995. Higgins Exchange is priced at $1,595.

Conetic Systems, Inc., 1470 Doolittle Drive, San Leandro, Calif. 94577, or call (415) 430-8875.

Automated switchboard attendant system bows

Message Processing Systems, Inc. introduced an automated switchboard attendant system.

Auto-Tend, which ranges in size from four to 16 ports, answers incoming calls with a prerecorded company greeting and provides the caller with the capability to dial an extension directly or to choose from a menu of other options, including dialing a department secretary and waiting for a live operator. The system also gives the caller the choice of holding if the line is busy or transferring to another extension, which could be a voice-mail system.

As an option, the system's directory feature enables callers to use telephone key pads to spell the names of individuals they are trying to reach. Designed to emulate a standard single-line telephone set, Auto-Tend works with a private branch exchange, Centrex or hybrid system that provides standard tip and ring signaling.

The system comes in a 6-in.-high, 19½-in.-wide and 16¾-in.-deep tabletop enclosure or in a standard 19-in. rack-mountable chassis that can be mounted into an existing telephone equipment rack.

A four-port Auto-Tend is available now for $12,000.

Message Processing Systems, Inc., 8848 Red Oak Blvd., Charlotte, N.C. 28217, or call (704) 527-8888.

AT&T announces X.400 gateway for AT&T Mail

AT&T enhanced its AT&T Mail electronic messaging service to enable subscribers to exchange messages with other E-mail services via the X.400 protocol.

With the new **AT&T Mail Gateway400,** AT&T Mail users can exchange E-mail with users of Telecom Canada's Envoy 100 E-mail service via the Envoy Message Handling System option. The new software also enables AT&T Mail messages to be exchanged with Digital Equipment Corp.'s Mailbus via an X.400 gateway. Mailbus is a DEC VAX-resident program that links DEC's All-In-1 with various E-mail systems, including IBM's Systems Network Architecture Distribution Services and DISOSS. AT&T Mail users will also be able to communicate with users of DEC's All-In-1 via DEC's Message Router X.400 software.

Fees for the new service are based on message length and will generally range from 40 cents to 80 cents. There will be an additional 25-cent to 50-cent charge for messages transmitted to Canada.

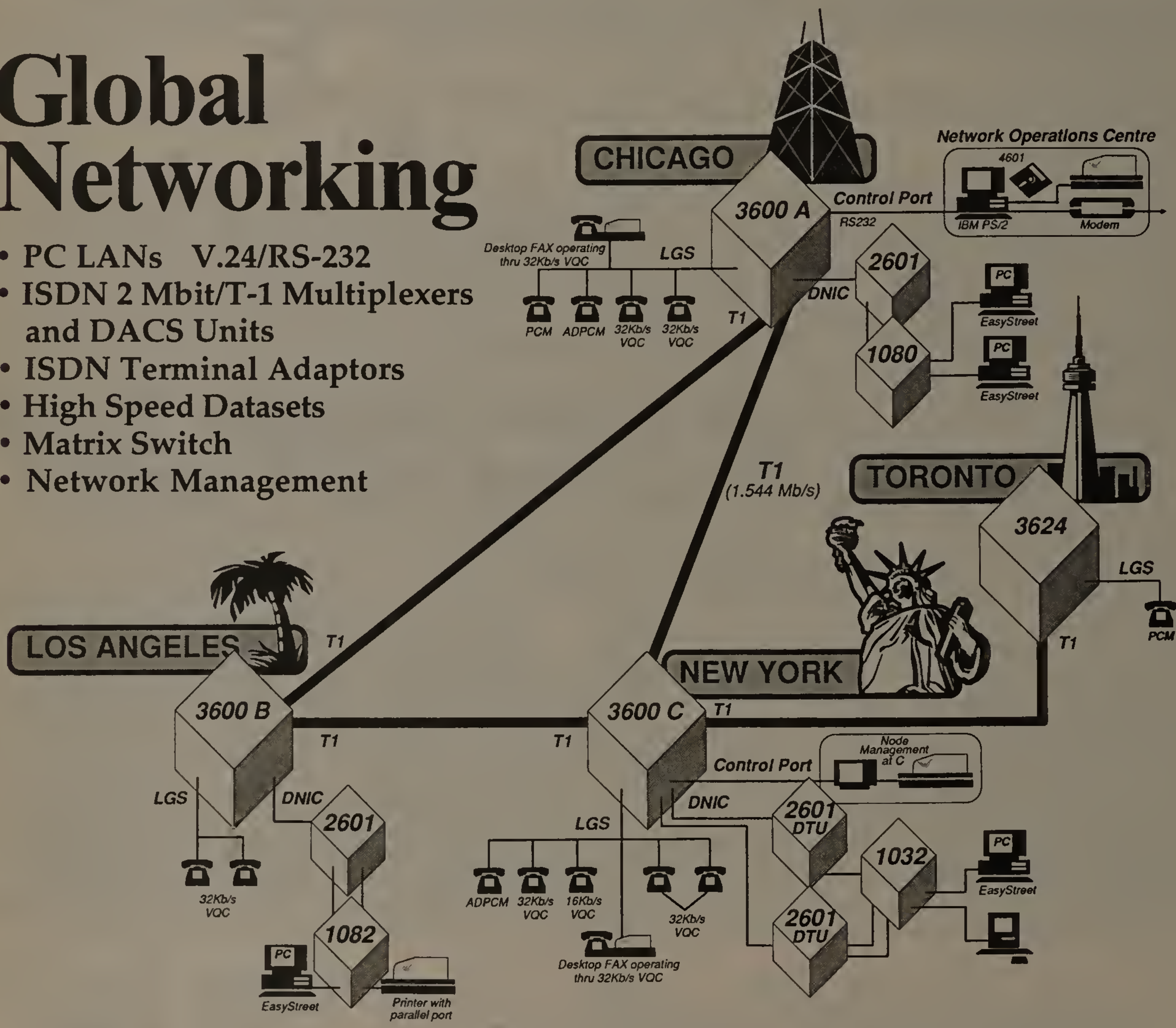
AT&T, Room 2327-G2, 295 N. Maple Ave., Basking Ridge, N.J. 07920, or call (800) 247-1212.

Boards link IBM's PS/2 to System/3X, mainframe

IDEAssociates, Inc. released emulation boards enabling IBM's Personal System/2 to link to a remote IBM System/34, System/36 or System 38 minicomputer or to a local IBM mainframe.

The **IDEAcomm 5250/Remote MC** board and software make the Personal System/2 appear to a remote IBM System/34, System/36 or

See **IDEAssociates** page 31



Global Networking

- PC LANs V.24/RS-232
- ISDN 2 Mbit/T-1 Multiplexers and DACS Units
- ISDN Terminal Adaptors
- High Speed Datasets
- Matrix Switch
- Network Management

Newbridge . . . for better networks

Local and International
Newbridge supplies every element for a truly global voice and data network. Systems that will extend your reach across the continent—or around the globe—from your personal computer database directly into another. Painlessly and economically.

And, whether you're looking for cost-effective control over the bandwidth of your voice and data channels or management of your entire network, we provide all the tools for worry-free network control and maintenance —for a local network or one that stretches across the continent.

What's more, all our networking products conform to today's international standards and will evolve along with them, providing you with worldwide communications now and maximum flexibility for growth in the future.

From a local area network to a wide area network. From private networks to public. From one side of the globe to the other.

1000 Series MainStreet Desktop Networking products for low-cost, highly effective PC file- and resource-sharing.

2600 MainStreet™ ISDN Terminal Adapters for RS-232, X.21 and V.35 interfaces to basic-rate terminations in North America and Europe.

Visit us at 5/234 at Telecom '87 in Geneva to see our global network in action.

3624 MainStreet Intelligent Channel Banks for low-cost T-1 voice and data multiplexing.

3600 MainStreet Bandwidth Manager is both a primary-rate multiplexer and a digital cross-connect system, with subrate multiplexing, T1/CEPT interconnection, advanced voice compression, and more....

4600 MainStreet Network Management Units control all MainStreet equipment and are compatible with foreign equipment as well ... to keep your global network up and running.

NEWBRIDGE

Call toll-free for more information: U.S, 1-800-332-1080; Canada, 1-800-267-6246; United Kingdom, 0-800-373799; Hong Kong, 5852-5-8071380

Newbridge, MainStreet and their respective logos are trade marks of Newbridge Networks Corporation. Copyright 1987, Newbridge Networks Corporation.

Why It's Smart To Control Your Fax Network Like An Airport.

Think of the 3M FaxXchange™ as a control tower. Without it, your facsimile machines are operating inefficiently. And that's costing you time, money and effort.

But with a FaxXchange system, you can change all that. Add it to your existing fax network. And you can send messages from your office to another FaxXchange anywhere in the world in as little as three seconds per page. Shorter fax transmissions mean you'll spend less on expensive telephone line time.

The FaxXchange saves labor, too. Your fax operator has to make only one insertion, and the FaxXchange can broadcast hundreds of copies of a document to as many as a thousand fax machines.

Find out how the FaxXchange can put you in total control. Visit booth 1309-1313 at the Telecommunications Association Show Sept. 29-Oct. 1. Or call 1-800-328-1684 (in Minnesota, 1-800-792-1072).

☐ Please send me a free brochure about the 3M FaxXchange.
☐ Please have a sales representative call me.

Name________ Title________
Company________
Address________
City________ State____ Zip____
Phone (____)________

Return to: The FaxXchange, Attn: G. Collins,
3M Center, Bldg. 225-3N, St. Paul, MN 55144

©1987, 3M

3M

Five organizations with a single purpose:

Digital Communications

Come see all of us at the TCA conference and find out why Fujitsu should be your single source for digital communications.

When you visit our booths #328-334 and #1323-1324, we'll show you our latest advances in digital communication products, all of them based on more than 50 years of experience developing world-class technology.

○ Fujitsu America Data Communications Division will exhibit its family of high-performance modems, featuring Fujitsu's new 19.2 kbps modem.

○ Fujitsu America Transmission Division will display its fiber optic OMT-135 intelligent point of presence terminal and the 192-channel optical digital loop carrier.

○ Fujitsu Business Communications will exhibit its wide range of focus® PBX systems that bring complete digital services and capabilities into the business office, serving from 10 to 10,000 telephone lines.

○ Fujitsu GTE Business Systems will display voice and data connectivity with the Omni® SIII and its new OMNI SIV, a 10,000-line voice/data digital PBX.

○ Fujitsu Imaging Systems of America will demonstrate its wide range of dex® facsimile terminals, featuring the new model 7800, a group III, IV unit with plain paper laser printing capabilities. Also featured will be two new cost-effective, entry level units: the dex 10 and dex 2200, designed for first time FAX users or small- to medium-size businesses.

All five Fujitsu organizations have come together under one roof at TCA. If you're talking digital communications, talk to Fujitsu.

Register to win a Fujitsu COMMANDER™ cellular mobile telephone at booth #1323-1324.

See us at TCA Booth #328 - 334.

FUJITSU

FUJITSU AMERICA, INC.

Fujitsu America
Data Communications Division
San Jose, California
408-432-1300
Booths #328-334

Fujitsu America
Transmission Division
San Jose, California
408-432-1300
Booths #1323-1324

Fujitsu Business Communications
Anaheim, California
714-630-7721
Booths #328-334 and 1323-1324

Fujitsu GTE
Business Systems
Tempe, Arizona
602-921-5900
Booths #328-334

Fujitsu Imaging Systems
of America
Danbury, Connecticut
203-796-5400
Booths #328-334 and 1323-1324

IDEAssociates from page 28

System/38 minicomputer as an IBM 3180 terminal. In addition, it makes Personal System/2-attached printers appear as IBM 5256, 5224, 5225 or 5219 printers.

By supporting the text-entry assist feature of IBM's 5294 terminal controller, the IDEAcomm 5250/Remote MC enables Personal System/2 users to access such System/36 applications as IBM's DisplayWrite/36 word processing and Personal Services/36 electronic mail. It is compatible with IBM PC Support/36 and PC Support/38 file-transfer programs.

The **IDEAcomm 3278/MC** enables Personal System/2s to appear to an IBM mainframe as if they are IBM 3278 or 3179 terminals linked via coaxial cable to a local IBM 3174, 3274 or 3276 cluster controller. The product operates in native IDEA mode, which allows file transfer and screen updates, or Irma mode, which supports personal computer-to-mainframe link programs written for the Digital Communications Associates, Inc. Irma emulation board.

Available now, the IDEAcomm 5250/Remote MC board and software are priced at $795, while the IDEAcomm 3278/MC, including an interface board, emulation and file-transfer software, costs $995.

IDEAssociates, Inc., 29 Dunham Road, Billerica, Mass. 01821, or call (617) 663-6878.

▶ *VOICE-MESSAGING SYSTEM*

Centigram unveils new version of VoiceMemo

BY JIM BROWN
New Products Editor

SAN JOSE, Calif. — Centigram Corp. recently introduced its VoiceMemo II, a newly designed modular voice-messaging system that replaces the company's older VoiceMemo I.

The firm's new Modular Expandable System Architecture enables a base VoiceMemo II system supporting four ports, 50 mailboxes and five hours of digitized voice storage to expand to a fully configured 120-port system supporting 10,000 mailboxes and 200 hours of voice storage.

The existing VoiceMemo I line includes several models, each of which supports a varying number of ports and mailboxes.

Users wishing to grow beyond the limits of one model are required to purchase a new VoiceMemo I system.

The new systems enable users to add two-port line cards to the VoiceMemo II chassis. When the first chassis reaches 24 ports, users can add another chassis via a Small Computer Systems Interface bus, which requires the use of four-port card slots on the base chassis. Up to three add-on chassis, each supporting up to 32 ports, can be linked to the base chassis to bring the total system up to 120 ports and 200 hours of storage.

VoiceMemo II uses a proprietary pulse code modulation-based technique that digitizes incoming voice at 64K bit/sec. A proprietary compression algorithm reduces that 64K bit/sec line to nearly 18K bit/sec. Each second of speech requires 4K bytes of storage.

Among its special features, VoiceMemo II can be configured to deliver messages to users at designated telephone numbers. It also supports up to 32 different classes of service, which define the features each user is allowed to access.

In addition, VoiceMemo II will transmit message-waiting notifications via radio pagers, retain port-usage statistics and support English, French, Spanish and Japanese voice prompts.

VoiceMemo II interfaces with several private branch exchanges including Telex Computer Products, Inc.'s 1001 and 1200/5000; Mitel, Inc.'s SX 100, SX 200, SX 1000 and SX 2000; Siemens Information System, Inc.'s Saturn; Hitachi America Ltd.'s DX; and AT&T's System 75 and System 85.

Additional software packages enable VoiceMemo II to integrate with other PBXs, including NEC America, Inc.'s 2400, ITT Corp.'s 3100, Intecom, Inc.'s IBX and Northern Telecom, Inc.'s SL-1. In addition, VoiceMemo II integrates with Centrex services offered via AT&T's 1AESS and 5ESS and Northern Telecom's DSM central office switches.

VoiceMemo II can also be configured as an automated attendant console, answering incoming calls and directing them accordingly. The product can be configured to support voice-messaging service providers who rent voice mailboxes to consumers.

Pricing

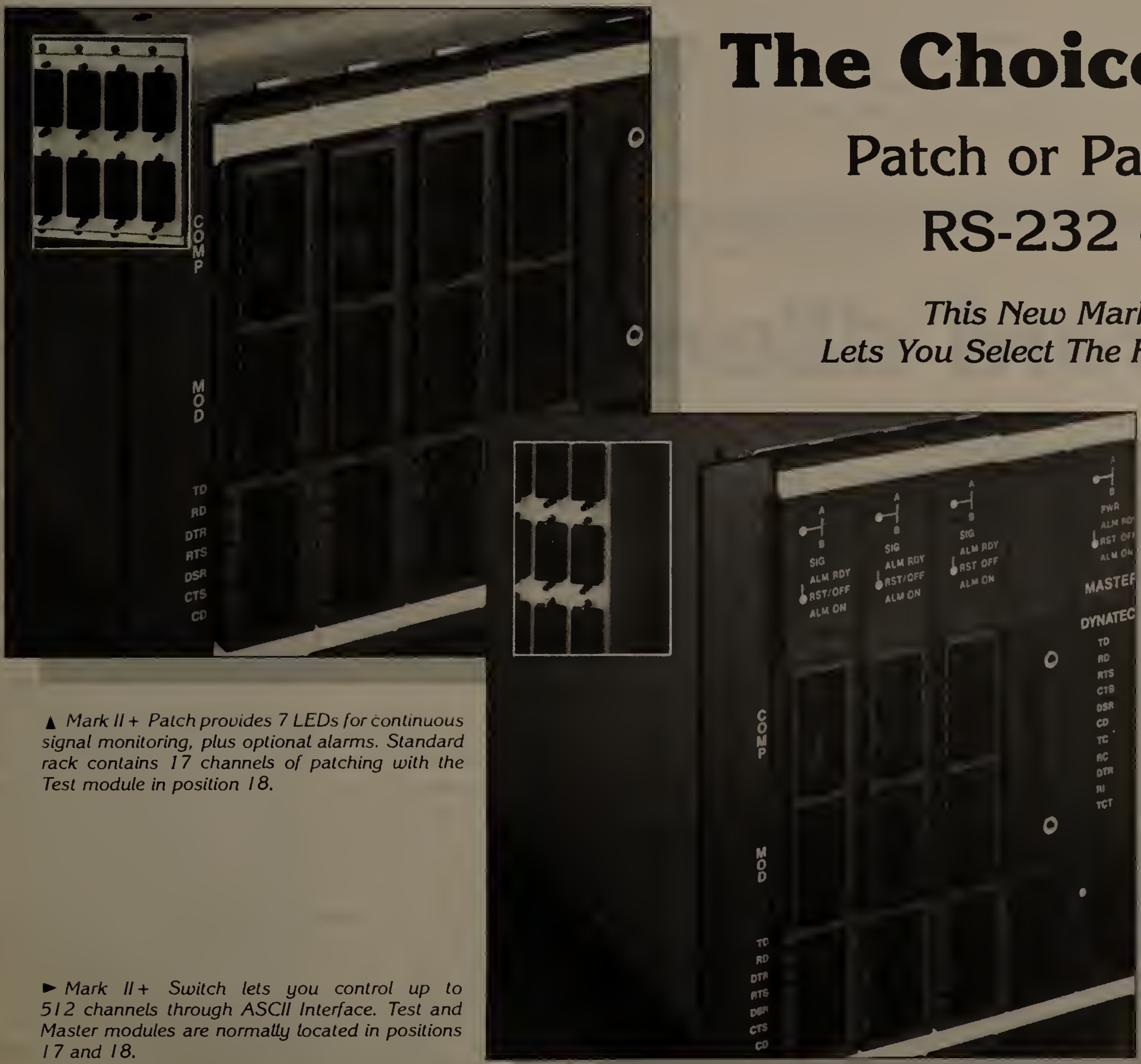
Sold primarily through distributors, an entry-level four-port VoiceMemo II system supporting five hours of storage has a suggested retail price of $32,000. A 24-port system supporting 30 hours of storage is priced at $105,000, while a 120-port system with 200 hours of storage costs less than $300,000.

Centigram is located at 4415 Fortran Court, San Jose, Calif. 95134, or call (408) 942-3500.

The Choice is Yours!

Patch or Patch/Switch
RS-232 or V.35

This New Mark II+ Series
Lets You Select The Features You Want



▲ *Mark II+ Patch provides 7 LEDs for continuous signal monitoring, plus optional alarms. Standard rack contains 17 channels of patching with the Test module in position 18.*

► *Mark II+ Switch lets you control up to 512 channels through ASCII Interface. Test and Master modules are normally located in positions 17 and 18.*

Such as a direct interface to RS-232 or V.35 cables. Selectable monitoring and alarms. Remote control switching. Manual switching with built-in interlock. Full monitor and test interfacing. *All in a standard 18-slot rack that lets you change modules without touching the cables.*

Since you select the features you want, you never have to buy what you do not need. Or jury-rig a cable to provide the required interface. *The Mark II+ Series is designed to save you money without compromising capability.*

And, best of all, the Mark II+ Series is from Dynatech. And it carries our lifetime jack replacement guarantee. *Stop by our booth (#1004) at the TCA in San Diego and see all of the Mark II+ features.*

Dynatech
Data Systems

7644 Dynatech Court
Springfield, Virginia 22153
800-368-2210
In Virginia, (703) 569-9000

Opinions

NETWORK MANAGEMENT

JAMES G. HERMAN

Choices for managers

It should be no surprise that network management is the top priority of most communications managers. Net management is essential to meeting company goals for service and cost-effectiveness. When considering the development of a private network, planners and designers must formulate a network management strategy addressing the following key points.

At the top level, managers must decide whether to deploy and operate the network with in-house staff or to contract with a vendor or service provider. The large systems houses that provided turnkey application systems in the '70s and '80s are gearing up to provide turnkey network systems in the late '80s and '90s. With their ability to generate significant economies of scale by operating multiple client networks with shared facilities and highly trained staff, these companies may be able to do a better job at a lower cost than individual users trying to run their own networks.

If you decide to manage the network yourself, the next question is how to organize operations and planning. Should all networks (wide-area and local-area, voice as well as data) be managed from a common facility with a single staff? If not, how should responsibility be split? A particularly thorny question here concerns local- vs. wide-area nets.

Should local nets be considered extensions of wide-area networks and managed centrally, or should they be managed individually on a local basis? Although most local nets are managed locally today, this is not likely to continue. Centralized, remote management of local-area nets allows for full end-to-end visibility across many networks for troubleshooting and permits the most effective use of trained specialists in local net technology. Of course, centralization of all local move and change activity could create a nightmare of backlog and delay if the central operations group is not adequately automated to handle the job.

Another strategic decision concerns relating network management to application management. Users can't tell the difference between an application problem and a network problem. They want a single help desk that can solve all their problems. So, at some level, there must be integration of management.

As applications become more distributed, managing them becomes more and more like managing a complex, distributed network. Many of the same standards, techniques and tools for centralized, remote network management will be needed here, too. In most cases it will not be practical to integrate applications and network management totally. Instead, it will be necessary to develop the means for all the firm's management systems to work cooperatively, exchanging data using common protocols.

Finally, in assessing the functions needed to deploy and operate a complex collection of networks, planners and designers must decide on what to buy vs. what to build. Most large network administrators supplement their vendor-supplied network hardware with a variety of third-party software packages and systems developed in-house. Inventory control systems, trouble-ticket systems, billing systems and specialized monitoring displays are some examples.

In a few years, it may not be so routine to buy network management systems from the same vendor that supplies the network switching or multiplexing equipment. Network management requires powerful, integrated information systems, akin to major MIS applications. Providers of network equipment may not be the best at developing such systems. Specialized providers may be the eventual winners.

After making these strategic choices, network managers are left to consider the number of operation centers, where to put them, how to staff them and how they may back each other up. What will be the procedural and electronic interfaces between centers for each network, the application data centers and even the carriers? How will these evolve over time? In approaching net management, it is extremely important to look at the long-term consequences of today's choices. The options are changing rapidly, while the problems continue to get more difficult.

The best instrumented and supported networks will be the most powerful competitive weapons of the 1990s. Networks that lack adequate management will be hard to change, more costly and potentially weak under the weight of their own complexity. Bureaucracy will replace service.

Don't let network management become the limiting factor in the growth and effectiveness of your company's network.

Herman writes, teaches and consults on telecommunications technology in Cambridge, Mass.

FINANCIAL NETWORKS

JAMES KOBIELUS

Debit-card dilemma

Two big worries keep debit-card proponents tossing in their sleep. The first is that the public, jealously guarding its beloved three-day float, will thumb its collective nose at debit cards. The second worry, ironically, is that consumers will fall in love with the cards and begin using them in a big way.

How could this be? Why do debit-card proponents fear success? For the same reason that local governments aggressively promote economic development while choosing not to think about the traffic jams that inevitably result. New traffic over existing highways spells congestion, longer waits and bigger headaches for all concerned.

Most debit-card networks — or point-of-sale networks, as they're most commonly known — send card authorizations and electronic drafts of retail purchases over the same circuits and switches that carry automated teller machine transactions. Shoppers insert their debit cards — typically a bank-issued magnetic-striped ATM card — into checkout-lane POS terminals and key in their personal identification numbers (PIN). Each terminal queries the card-issuing bank's computer for authorization and, once approval has been granted and the sale rung up, forwards electronic sales drafts to the merchant's bank and the card-issuing bank. The purchase amount is then automatically debited from the shopper's bank account and credited to the merchant's account.

Theoretically, it's a beautiful arrangement. Shoppers enjoy cashless convenience while merchants receive near-immediate payment. The new services piggyback on the existing ATM network, spreading fixed network costs over a greater number of transactions.

This lovely scenario falls apart, however, as debit cards catch on and traffic skyrockets. What happens when every major retailer has installed POS terminals and shoppers begin to use the cards readily? The ATM net — built to handle, say, a half-dozen transactions monthly by each cardholder — is called upon to support two or three transactions per day, per cardholder. Gridlock becomes a reality as busy messages nag at users, response times stretch to eternity and delays at checkout counters and bank machines create long lines of frustrated consumers.

That's not to say the perils of piggybacking POS services on ATM nets have gone unrecognized. Already, there are specialized POS nets in place — California's Interlink is one noteworthy example — with enough switching and transmission capacity to handle the long-anticipated deluge of traffic.

Unfortunately, while specialized POS networks may present an attractive engineering solution, they're an economic mistake. For one thing, they fail to provide the economies of scale that justify joint ATM/POS nets.

The major shortcoming of specialized POS networks, however, is that they require participants to invest heavily in communications capacity and run up expensive phone bills. The up-front payout

Kobielus is research associate for the International Center for Information Technology in Washington, D.C.

Progress is the product of ideas and discussion. Contribute to the process by writing a column for *Network World*. Manuscripts must be letter quality, double-spaced and approximately 600 to 750 words in length. Disk or modem submissions are preferred. Columns should be timely, controversial, literate and technically accurate.

Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 732.

▶ TELETOONS — By Phil Frank

This year's User Excellence Award goes to the J.P. Finley Corporation, who has never called us!!
MEGA-NET CORPORATION
Phil Frank

for terminals, switches, software and other network components is enormous. The continuing telecommunications charges — from 30% to 50% of ongoing POS expenses — are too big to ignore. It costs approximately 50 cents to process a POS transaction in real time, not appreciably different from the 40 cents to $1 it costs to process a paper check.

But there's an alternative to online POS that, though less well-known, can slash communications costs to the bone. That alternative — the automated clearinghouse (ACH) system — differs from online POS in two ways. First, the sales transaction is carried out completely off-line, though it still requires a POS access card. Second, electronic sales drafts are forwarded to the ACH and then to card-issuing and merchant banks, once or twice a day in a batch, rather than at the time of the sale. The cost of processing a transaction is about 10 cents.

If ACH is so cost-advantageous, why aren't banks and retailers abandoning on-line POS in droves? Because they're afraid to authorize debit purchases without first checking to see whether shoppers are holding valid debit cards and have enough money in their bank accounts to cover their purchases. They're just not sure they can trust the buying public.

A solution that combines the advantages of on-line POS with the best features of ACH nets involves replacing magnetic striped POS access cards with microchip-bearing "smart" cards. POS transactions need to be on-line only to perform card authentications and balance inquiries. Smart cards could carry out both functions off-line. PIN validations would be performed internally by the card's own microprocessor, and the card would also determine whether a shopper has stored enough preauthorized purchase credits in memory to cover a transaction. Where would these stored credits come from? Ideally, consumers would be able to download money into their smart cards at any ATM.

But even when all the technical and cost issues are resolved, POS proponents are still haunted by their first — and overriding — worry: Will consumers use debit cards?

STRATEGIC COMMUNICATIONS

JOHN CAROSELLA

Sifting facts from fables

The strategic use of telecommunications has become the latest hot topic for telecommunications managers and now rivals "network management" as an industry buzzword. Supposedly, by using telecommunications strategically, telecommunications managers will soon become presidents or chief executive officers of their firms. Failing that, they will certainly become vice-presidents of MIS. The key to such rewards is simply to find a creative approach to solving business problems that turns telecommunications from a cost center to a profit enhancer.

Like most fables, this one has more than a grain of truth to it. There are definite rewards to solving business problems. Unfortunately, most thoughts about strategic telecommunications use are being conducted at the fable level, rather than at a practical level. Successfully using communications in a strategic manner requires much discipline, effort and analysis.

The three key steps to the strategic use of communications technology are: to understand thoroughly the business and its components; to identify how communications can enhance business goals; and to focus on components of the business that are most valuable and to which communications can provide the most benefit.

The first step — understanding the business — goes beyond knowing unit sales or the number of customers. Most important is understanding the elements that differentiate a business from its competition; the flow of goods from raw materials providers to customers and the value added at intermediate steps; and the information that is needed to support the associated processes.

Gaining this understanding may require personnel with a business, rather than a technical, background. At this point, the problems are not technical ones.

The next step, determining how to use communications creatively to serve business objectives, is the most difficult and the most frequently discussed. There have been a fair number of success stories, such as Merrill Lynch & Co.'s Mernet II T-1 network, but there is no canned procedure for replicating them. Some methods that have worked in the past include tracking developments such as Electronic Data Interchange and Computer-Integrated Manufacturing, organizing brainstorming sessions to generate new ideas and working with end users to improve their operations. In all probability, the activities necessary to keep the business operating are being performed currently. The challenge is to find a better way to do this.

The third step is not necessarily performed after the other two. Determining the appropriate focus for the strategic use of communications is simply a question of how to invest scarce resources. One good method is to classify projects in terms of the necessary investment in personnel, capital and services, and the anticipated return on that investment. Ideal opportunities have a low investment and a high payback; the worst choices have a high investment and low payback. Whether to pursue projects that have a low investment and low payback or a high investment and a high payback depends on the magnitude of the payback and whether a single high impact project is better than a number of low impact — and probably lower risk — projects. The key is to match resources to projects.

There's one more point that can't be ignored: Telecommunications is a results-oriented business. All plans must be backed by proper planning, implementation and evaluation. This business also requires realism when determining what communications alone can provide. Improving order-taking through an automatic call distributor won't help if the computer system can't support the increased volume. Strategic communications must be part of a well-planned and implemented strategic information system.

There is no easy way to transform communications from a cost center into a business resource. Like most worthwhile objectives, it requires time, detailed analysis and hard work. But the rewards may be worth the effort.

Carosella is a consultant with Network Strategies, Inc., a communications consulting firm in Fairfax, Va.

▶ *INFLUENCING POLICY*

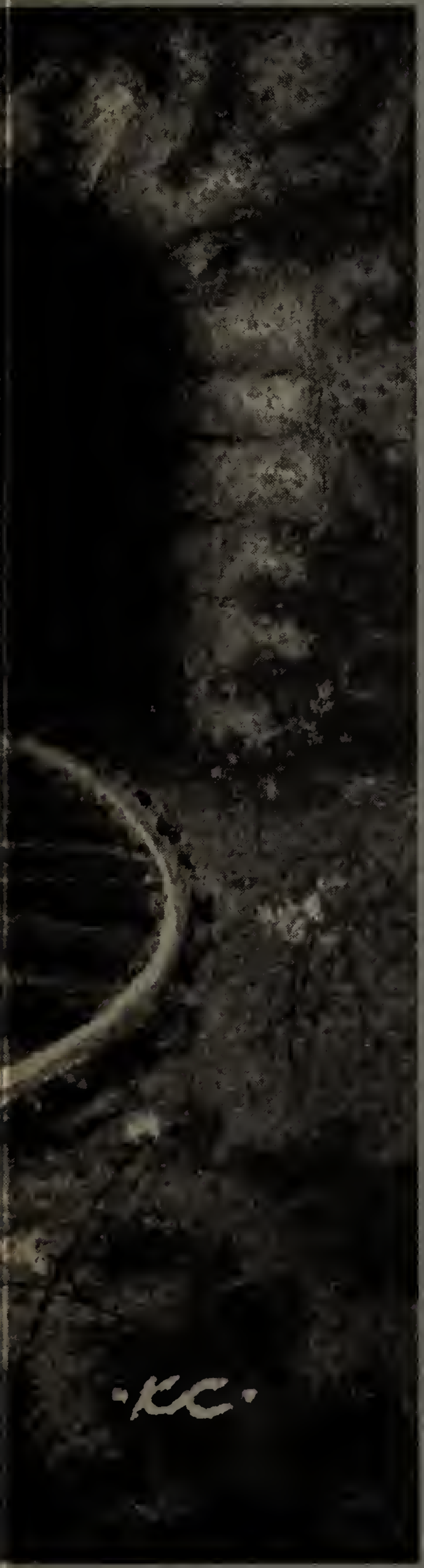
User, vendor interests

ILLUSTRATION ©1987 KEN CONDON

NETWORK WORLD
Features
September 28, 1987

collide in Washington

Users group lobbying often derails vendors' better-financed efforts.



BY STEPHEN BARLAS
Special to Network World

One morning last winter, friends that Brian Moir hadn't heard from in years read about him in newspapers nationwide and promptly jammed the phone lines in his Washington, D.C. law office. The day before, Moir had staged a press conference at the National Press Club to air International Communications Association (ICA) criticisms of the Justice Department's recommendations to ease Modified Final Judgment restrictions on the regional Bell holding companies.

Moir, perhaps the most aggressive lobbyist for telecommunications users on Capitol Hill, is a lawyer with Fisher, Wayland Cooper and Leader and counsel to the ICA. He was formerly senior counsel for the U.S. House Energy and Commerce Committee.

Also at the conference, adding his voice to Moir's protests, was Gene Kimmelman, legislative director of the Consumer Federation of America. The unusual joint attack by sometimes warring consumer and business lobbies caught the attention of the media, including *The Wall Street Journal*, and the next day, Moir and the ICA were in the nation's headlines. The ICA was questioning whether adequate safeguards were in place to ensure true competition if the RBHCs were freed by U.S. District Court Judge Harold Greene to enter lines of business prohibited under the Modified Final Judgment.

"That press conference had a magnificent effect," says Al McGann, vice-president of public affairs at AT&T. "It caused a number of legislators to reconsider their positions on the MFJ. It was the single most effective piece of lobbying I've seen in the past year."

Moir says the ICA played a major role in orchestrating the efforts of the industry to influence the proceedings before Judge Greene. Such creative tactics have made the Dallas-based ICA possibly the most visible and effective users group in Washington, D.C.

Lobbyists for communications users groups — usually lawyers who handle telecommunications groups in addition to other clients — frequently earn accolades. Users groups can boast about their won-lost record at the Federal Communications Commission and in Congress. They've chalked up an enviable record against the RBHCs and other vendors, many of whom employ full-time staffs in the nation's capital and spend considerable sums trying to bend the will of Washington in their direction.

Like other lobbyists, the ICA employs a variety of advocacy methods. Among the tactics used when approaching independent regulatory agencies such as the FCC are personal meetings with officials, direct filings to influence proceedings and coordination of efforts with other lobbying groups.

Two other aggressive users groups are The Ad Hoc Telecommunications Users Committee and the Committee of Corporate Telecommunications Users (CCTU). Ad Hoc's well-regarded Washington point man is James Blaszak, an attorney with Washington law firm Heron, Burchette, Ruckert and Rothwell. Before entering private practice in 1979, Blaszak spent five years as legal assistant to the chief of the FCC's Common Carrier Bureau. Blaszak was also active in opposing the lifting of the Modified Final Judgment restrictions and sent his comments to Judge Greene. McGann says that Blaszak's comments impressed Greene and may have influenced his decision to reject RBHC entry into the manufacturing and long-distance markets. "[Blaszak] has a terrific reputation," McGann adds.

The CCTU, which is often involved in user coalitions formed to address telecommunications issues at the FCC or on Capitol Hill, has harnessed two law firms. Hank Levine at Morrison and Foerster lobbies the FCC for the CCTU, while Mike Faber and Ted Meyers at Reid & Priest handle Capitol Hill. The CCTU was one of two advocates — IBM was the other — that pressed the FCC to preempt state regulation of enhanced services, which the FCC did in June 1986 as part of the Third Computer Inquiry and again in May 1987 as part of the Computer III reconsideration order.

A less active second tier of user lobbyists includes the Association of Data Communications Users (ADCU), the International Association of Satellite Users and Suppliers (IASUS) and the Network Users Association. The latter is the only one of the six to do no lobbying at all. "We're a clearinghouse for users that want to speak with a unified voice to the standards community," says Kate Howells, vice-president of information services for OmniCom, Inc., a standards consulting firm in Vienna, Va. She also heads the public relations committee for the Network Users Association.

IASUS is the only one of the six

Continued on page 39

Barlas is a free-lance writer based in Arlington, Va.

“You think they look happy? You should see the guys in admissions.

Good as the Bradley name has always been, it's not yet on everyone's lips. That's always made the competition for students and faculty harder for us. But now Bradley's changing the way we educate by changing the way we communicate. We've built a futuristic, electronically unified campus around AT&T voice and data networking. Now offices, labs, libraries and dorms are linked. And as for results, well, an extra 50 members of the class of 1991 can tell you,

AT&T Comes Through.”

—Dr. Martin G. Abegg, President
Bradley University

The AT&T Intelligent Campus

In place of multiple phone systems and incompatible computers, Bradley University now has a single fiber optic network, controlled by an AT&T System 85 voice and data switch and an AT&T Information Systems Network. All financed through the AT&T Credit Corporation.

Now mail and messaging for faculty and staff move electronically. Students can tap nine host computers at five locations from their dorm rooms via AT&T PC 6300s. And executives at nearby companies can take graduate courses via AT&T Teleconferencing.

What's more, reselling AT&T WATS on campus reduces payback time on the whole system by a full year.

To learn more contact your AT&T Account Executive or call 1 800 247-1212.

From equipment to networking, from computers to communications, AT&T is the right choice.

© 1987 AT&T

AT&T
The right choice.

If Man Were Meant to Pay So Much For WATS And DDD, We Wouldn't Have Invented OUTDIAL.™

OUTDIAL Service is Tymnet's lower-cost replacement for centrally-initiated DDD and WATS. Now your computer can call out to remote async devices directly through the TYMNET® network.

If your central computer places calls to remote async devices for information collection and distribution, we can save you 40% or more by

- Eliminating DDD and WATS charges
- Allowing unattended nighttime operations that use lower rates
- Offering discounted rates for large-volume users.

Tymnet's OUTDIAL Service was created to save big money for companies with big data communications needs.

Call **(800) 872-7654** and let Tymnet show you how much we might save you.

TYMNET
2560 North First Street
P.O. Box 49019
San Jose, CA 95161-9019

TYMNET
The Network Technology Leader

Outdial is a trademark of Tymnet, McDonnell Douglas Network Systems Company

See Us At Booth #1511 at The TCA Annual Conference

MCDONNELL DOUGLAS

From page 35

users groups that has a Washington office. Executive Director Fred Dassler heads a staff of three.

Vendor membership

It was only in 1985 that IASUS, formed in 1980, added "suppliers" to its name. Today, membership is evenly split between vendors and users. Dassler says IASUS decided to include vendors in response to member requests for information about suppliers but insists that including vendors has not compromised the group's ability to advocate user causes.

Corporate mergers and acquisitions have adulterated the purity of other users groups and led to some spitting matches within the user community.

Ken Phillips, chairman of the CCTU, complains, "There are conflicts within the ICA. They let [communications equipment] manufacturers in there." CCTU's bylaws prohibit membership for communications equipment manufacturers or carriers.

Moir acknowledges that ICA's members include companies such as IBM, which owns MCI Communications Corp.

To join, members must spend at least $1 million a year on telecommunications equipment. However, with all the mergers and acquisitions going on, it's hard to keep track of those among the ICA's more than 600 members that are bringing telecommunications vendors under their corporate aegis.

But, Moir adds, "Our membership is specifically restricted to companies that are predominantly users of telecommunications services — end users. That is defined as companies deriving most of their gross revenue from nontelecommunications vendor activities. This is the reason that the ICA has never had a problem with being identified as anything other than a pure user organization. This is not the case with some other groups."

Vendor encroachment is also visible at the 16-company Ad Hoc Committee, which comprises Fortune 100 corporations. Bill Pomeroy, manager of telecommunications at General Electric Co., chairs that group.

Because of its GE Information Services Co. and Factory Automation Products Division, GE is among the nation's leading telecommunications vendors, as well as a large user. However, Blaszak says, potential Ad Hoc members must share "common interests" with existing members that must approve their entry into the group.

Merger mania and the changing regulatory climate have depleted the ranks of Ad Hoc. The group had about 25 members in the early 1980s. "After we won the WATS issue, a lot of companies decided they no longer needed us," Blaszak says, referring to the FCC's threat to eliminate WATS as a discrete service. Ad Hoc is primarily a public policy advocate, and Blaszak says membership will grow again as the debate over the FCC's new AT&T rate cap proposal (FCC Docket 87-13) heats up.

While the major users groups —ICA, Ad Hoc and CCTU — quibble among themselves about such things as membership size and purity, decision makers in Washington tend to give lobbyists for all three groups uniformly good reviews.

"All of those people are extremely competent," says David Aylward, managing partner at National Strategies and former staff director of the House Telecommunications Subcommittee under Sen. Tim Wirth, (D-Colo.). Adds Bob Pepper, senior advisor to FCC Commissioner Patricia Diaz Dennis, "Overall, they're pretty good. They don't suffer against the RBHCs."

The wealthy opposition

Indeed, users groups' political triumphs should rank with David's defeat of

Continued on next page

Cook Electric 800 Series Building Entrance Terminals are designed for fast installation—the way Interconnects want them. Especially the compact, no-frills, 25-pair C-802 and the steel-cased C-830 with integral splice chambers and protection for 25, 50 or 100 pairs. All have quick punch-down terminals for both outside plant and equipment connections to save installation time and money. Call 1-312-470-2100.

nt northern telecom

© 1987 Northern Telecom

From previous page

Goliath. User lobbying successes have come despite formidable opposition from well-financed vendor lobbying groups that can afford to hire extremely well-connected people to spearhead their lobbying efforts.

BellSouth Corp., for example, has been snapping up influential experts at the rate the Marine Corps snaps up recruits. In March 1985, it hired Mickey McGuire away from his position as corporate vice-president at AT&T. McGuire became BellSouth's senior vice-president for governmental affairs.

"Mickey is one of the top two or three telecommunications lobbyists in Washington," says AT&T's McGann, who adds that there were no hard feelings when McGuire left. McGuire then hired Ray Nolin, another top AT&T lobbyist, and David Markey, who had headed the Commerce Department's National Telecommunications and Information Administration. Nolin then brought in Dan Murray from GTE Corp. and Dan Mattoon, a staffer of former Rep. Tom Corcoran, (R-Ill.).

Like the RBHCs, equipment manufacturer associations such as the Electronic Industries Association (EIA) and the Computer Business Equipment Manufacturers Association have heavily staffed Washington offices. The Washington headquarters of the EIA, which has 150 employees, is a veritable beehive of activity. Twenty EIA staffers lobby, four of them exclusively on telecommunications, and the other 167 also pull that oar when needed, according to Mark Rosenker, EIA's vice-president of public affairs.

Other influential vendor organizations include the Telecommunications Association, the Independent Data Communications Manufacturers Association, the North American Telecommunications Association and the Computer and Communications Industry Association.

PAC attack

Besides large lobbying staffs, the RBHCs, AT&T and vendor associations also field political action committees (PAC) that contribute campaign funds to U.S. House and Senate candidates.

In 1986, for example, both AT&T and US West, Inc., the parent of Mountain Bell, gave $10,000 to Rep. Ken Kramer (R-Colo.), who was opposing then Rep. Wirth in the Colorado Senate race. Wirth, former chairman of the House Telecommunications Subcommittee, was a strong user advocate who opposed freeing the RBHCs from the Consent Decree.

Wirth won the election. Fortunately for the RBHCs and AT&T, Wirth doesn't sit on the Senate Commerce Committee, through which most telecommunications legislation passes. However, Moir says, Wirth continues to express a high level of interest in telecommunications and has spoken out on related issues in the Senate already.

Other AT&T PAC action includes handouts, which totaled $950,000, to national candidates during the 1985-86 election cycle. Contributions from RBHC PACs ranged from about $330,000 from Pacific Telesis Group to much smaller amounts from the other RBHCS.

The EIA also has a PAC, but Rosenker says it distributed less than $10,000. He maintains, however, that the EIA helped corporate members decide where to put their PAC dollars.

In contrast, telecommunications users groups give their members no such formal guidance, nor do they provide any PAC money. Further, while one might expect users groups to augment their Washington efforts by enlisting the aid of lobbyists working on behalf of their corporate members, these corporate lobbyists and PACs don't always pay attention to telecommunications issues.

One GE official says that a legislator's position on telecommunications issues won't matter a whit when GE sits down to decide who on Capitol Hill to help out.

However, Moir observes that the ICA often does business with 75 to 100 Washington government relations offices run by ICA member companies and that important telecommunications issues attract the attention of individual companies.

William Coopman, manager of telecommunications for Deere & Co. and president of the ICA, says he rarely talks to Deere's Washington lobbyists about telecommunications issues. "We let ICA take the lead," he explains, "instead of covering that base and many others ourselves."

One congressional staffer who was involved in forming telecommunications legislation and who requested anonymity says Capitol Hill has noticed that corporate telecommunications users avoid the lobbying fray. "The top issue for the RBHCs is telecommunications," he says. "Companies that use telecommunications have a less intense interest. They are less willing to put everything on the line. That's the critical difference that has to be looked at when assessing

Continued on page 54

Our look at open systems will open a few doors for you.

NETWORK WORLD

It's happening everywhere — users and vendors alike are realizing that the future of communications lies in networking and in systems designed for multi-vendor connectivity.

Network World readers are influential decision makers who need to know more about these new business tools. They need to know what to buy and how to use what they already have.

They've opened their doors to new ideas, new products and new ways of doing business. And they'll open their doors to you — and the solutions you have to offer.

Network World has the key.

Our special editorial series called "Open Systems: How Open Are They?" will help put you — and your advertising message — in the limelight.

Evaluating nine of the industry's leading vendors and their networking capabilities, this 11-part series is sure to attract readers who are receptive to your message.

Network World's "Open Systems: How Open Are They?" is a great way to get your foot in the door.

Open Systems: How Open Are They?

Issue Date	Closing Date	Topic
July 20	July 8	Introduction/Overview
Aug. 3	July 22	Wang
Aug. 17	Aug. 5	Hewlett-Packard
Aug. 31	Aug. 19	Apple
Sept. 14	Sept. 2	Data General
Sept. 28	Sept. 16	IBM
Oct. 12	Sept. 30	Tandem
Oct. 26	Oct. 14	Prime
Nov. 9	Oct. 28	DEC
Nov. 23	Nov. 11	Unisys
Dec. 7	Nov. 25	Wrap-up

For more information on placing your ad and reaching over 65,000 communications/networking buying decision makers, call your local *Network World* sales representative listed below.

Boston (617) 879-0700/**New York** (201) 967-1350/
New Jersey/Pennsylvania (201) 967-1350/**Washington, D.C.** (301) 721-4763/
Atlanta (404) 394-7509/**Chicago** (312) 827-4433/**San Francisco** (415) 328-4618/
Los Angeles (714) 250-3006

NETWORK WORLD
An IDG Communications Publication

THE BEST CENTREX MANAGEMENT SYSTEM

CENPAC™

Manages 1/1A ESS™, DMS-100™, 5ESS™

Supports DMS-100™ Electronic Business Sets

Provides user-defined flexible reports

Automates line and feature changes

Gives users control of their Centrex database

Serves over a half-million Centrex lines today

CENPAC is a trademark of American Telecorp, Inc.
5ESS and ESS are trademarks of AT&T.
DMS-100 is a trademark of Northern Telecom, Ltd.

AMERICAN TELECORP

10 Twin Dolphin Drive
Redwood City, CA 94065
(415) 595-7000

Thanks, ICA members, for making Network World your best-read communications-oriented publication.

NETWORK WORLD

Gary J. Beach
Publisher

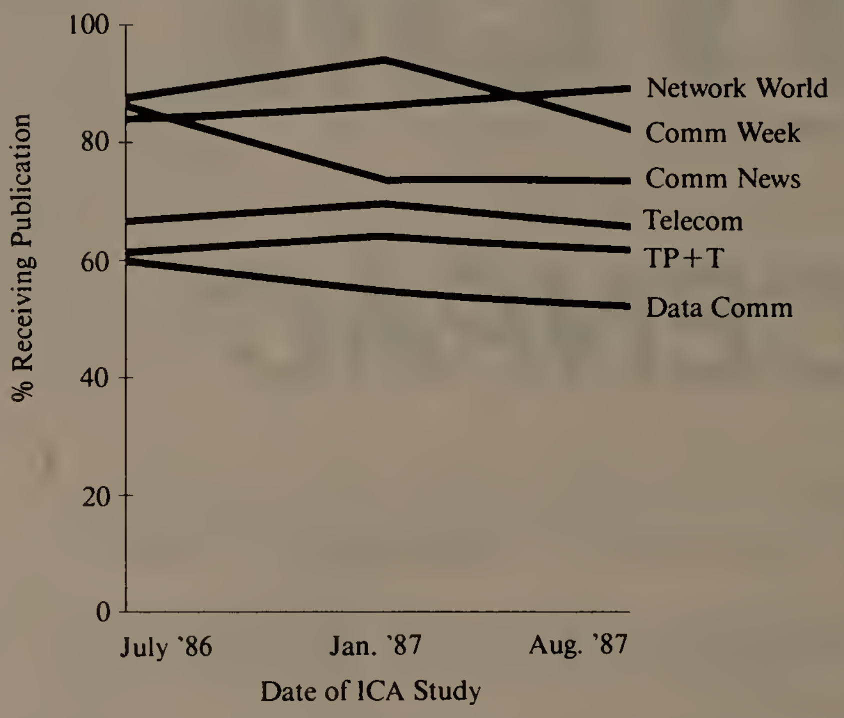
"Rome wasn't built in a day." Although you've heard this saying time and time again, the philosophy behind it — that through hard work you can make things better day by day, week by week, and year by year — remains sound.

It's this very philosophy that *Network World* editors have followed during the past 18 months. And in doing so, they have remained true to their initial goal: to make each issue of *Network World* the best possible for you, our readers.

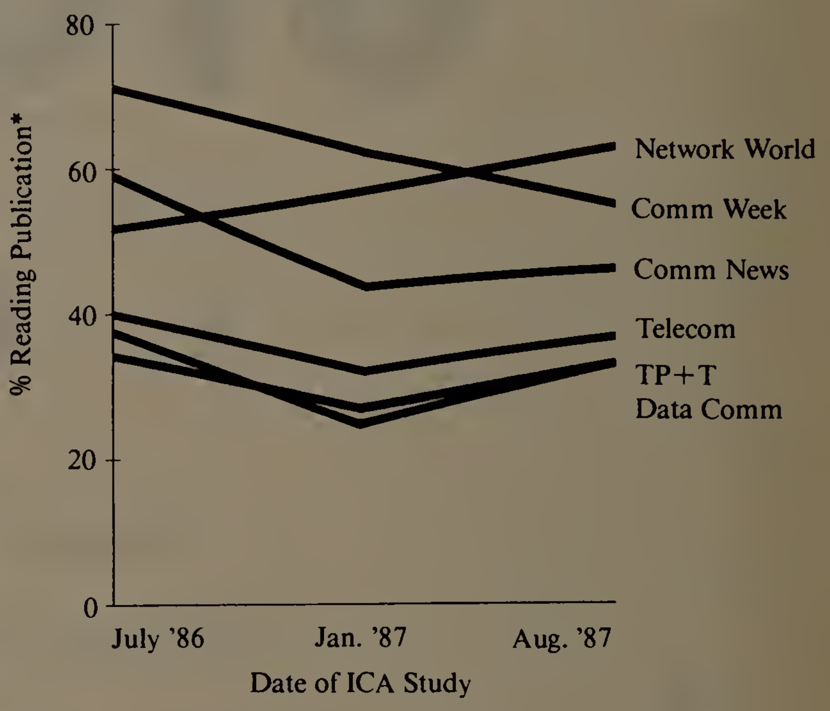
Evidence is growing that *Network World's* long-term commitment to editorial excellence is paying off. In fact, the latest study conducted by an independent research firm among ICA members shows rather impressive results. Not only does *Network World* top the list of communications-oriented publications in receivership, but it now ranks number one in readership as well.

As you can see in the following charts, both receivership and readership of *Network World* among ICA members have steadily increased since July 1986. However, during this time period, these same ratings have declined for almost every other communications-oriented publication.

Total Receivership of Communications-oriented Publications among ICA Members



Total Regular Readership of Communications-oriented Publications among ICA Members



* Readership figure for each publication is based on the number of ICA members who receive that publication.
Studies conducted by First Market Research of Boston.

There's no question about it. *Network World's* in-depth networking coverage is what enables us to deliver a unique editorial product that progressive communications users have come to rely on week after week.

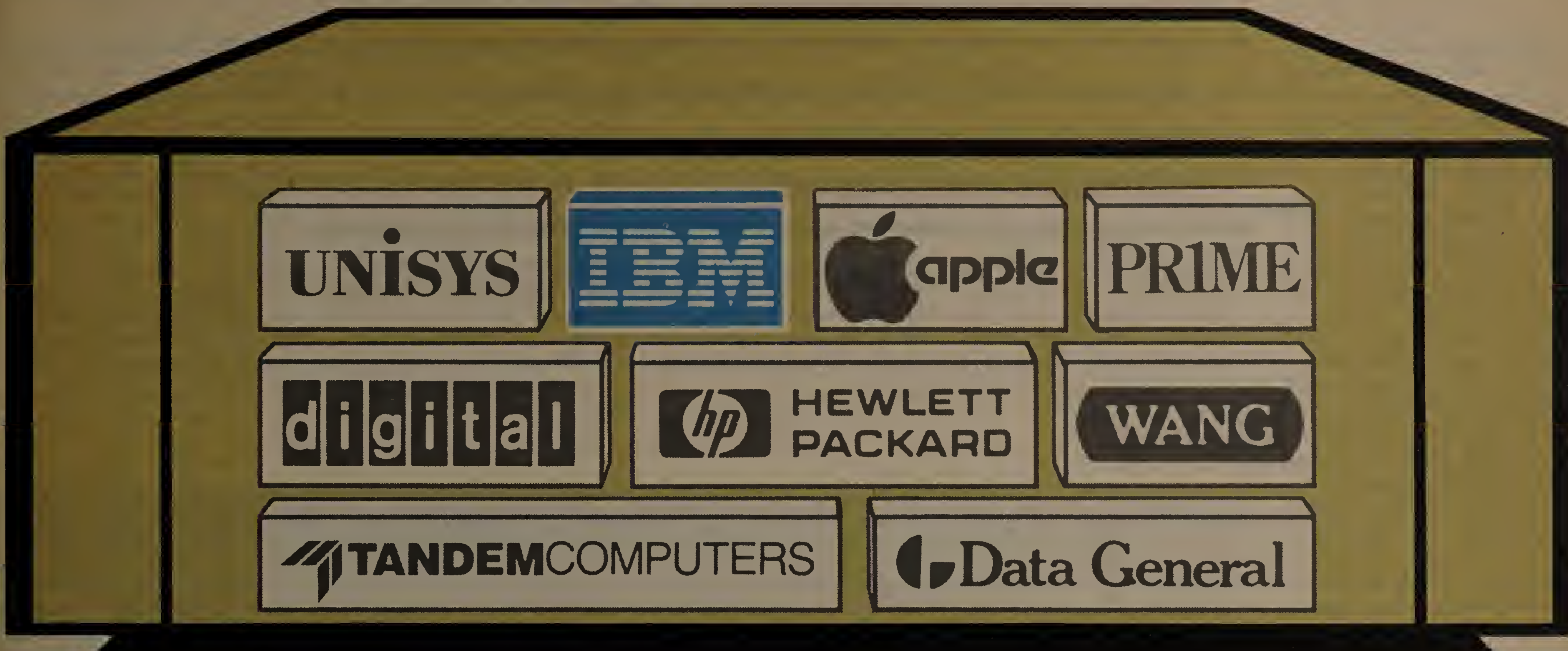
Thanks to the growing support of ICA members and continued dedication of all our readers, *Network World* is now the number one communications-oriented publication for today's leading-edge users.

Cordially,

Gary J. Beach

Gary J. Beach
Publisher

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700
An IDG Communications Publication



Open Systems: How open are they?

IBM walks the OSI tightrope

Continued from page 1

Ten years ago, IBM clearly aimed to impede competitors' efforts to design products that attached to Systems Network Architecture networks. Few IBM architectures were open, and competitors discovered hidden obstacles as they tried to reverse-engineer SNA products.

IBM mainframe users shied away from non-IBM products because it was difficult to attach them to SNA networks. Competitors said IBM viewed other suppliers' products as polluting pure SNA networks.

IBM has since made a 180-degree turn in its networking strategy that has become clear in the last 12 to 18 months. Big Blue is now encouraging other vendors to connect their wares to SNA networks and is actively developing products that conform to international standards (See the diagram on page 48).

Dixon Doll, president of DMW Group, Inc. in Ann Arbor, Mich., says the shift was sparked by IBM's positive experience with its first completely open device, the Personal Computer. IBM encouraged third parties to design product enhancements, and those were major factors in establishing the personal computer as a de facto standard, eventually contributing billions to IBM's coffers.

Doll predicts a similar course with SNA. "By opening up SNA, barriers to customer networks will be removed, and they'll need more equipment," he says. "IBM will then generate more revenue from its traditional businesses, such as computers, as well as from its networking products."

Ellen Hancock, president of IBM's Communication Products Division (CPD), defines openness at IBM: "Open means you publish some of your architectures for other vendors to implement; you provide programming interfaces so both customers and vendors can enhance your product offerings;

Continued on next page

From previous page

and — since it's hard today to be open unless you're also open to international standards — OSI and ISDN are becoming part of that definitional statement."

IBM denies that it only recently made its commitment to openness, saying it has outlined pieces of its network model, such as Synchronous Data Link Control, since 1973. Nevertheless, the company only recently began emphasizing SNA's openness. In September 1986, IBM announced Open Communications Architecture (OCA), a pledge to publish documentation about specific architectures and to hold classes to help other vendors design SNA products. The announcement outlined 14 network architectures, including old standbys such as SDLC and emerging items such as LU 6.2.

In March 1987, IBM unveiled another element in its attempt to open SNA: Systems Application Architecture (SAA), a blueprint that will let vendors write a single software package that will run on IBM Personal Computers, System/3Xs and mainframes. Currently, vendors have to develop separate packages for each processor.

Dale Kutnick, executive vice-president at Gartner Group, Inc. in Stamford, Conn., says SAA was developed in response to the success Digital Equipment Corp. experienced with its VAX processors. DEC VAXes of all sizes run the same operating system and application software and are easily tied together. Users have complained that IBM products lack such flexibility because the company supports a wide range of processors that cannot be easily connected.

TCP/IP downplayed

To implement SAA, IBM had to prioritize its networking architectures and select those key to SAA. The company admits that some existing standards probably never will be included in SAA and aren't key to Big Blue's long-range plans.

For example, IBM has pigeonholed the rapidly growing Transmission Control Protocol/Internet Protocol as a networking scheme needed only by a small group of users, such as universities and the government.

"We don't view TCP/IP as an appropriate networking solution for commercial users," says James E. Holland, advanced design communications manager at IBM's programming laboratory at CPD.

> In March 1987, IBM unveiled another element in its attempt to open SNA: Systems Application Architecture.

James P. Gray, an IBM fellow at CPD, adds that, although TCP/IP is becoming more important to some customers, its use will shrink over the next few years. "Organizations like the Department of Defense plan to migrate away from TCP/IP to OSI as it becomes more widespread," he notes.

IBM acknowledges that its NETBIOS network interface software, introduced with the IBM PC Network, probably won't become part of SAA. "The NETBIOS interface is bound to the PC environment and can't be easily used with other types of processors," Gray says.

IBM says blueprints like OCA and SAA help customers design networks that won't be rendered ob-

HOW DO YOU TELL YOUR BOSS
THAT YOU JUST LOST 10,000 HEAD OF CATTLE
IN DOWNTOWN MANHATTAN?
ONE WAY

TC-500A.
Statistical multiplexer providing sophisticated user interface.

DSP9630.
Two-wire, full duplex dial-up modem. Up to 9600bps. CCITT V 32 gives worldwide network compatibility.

DSP19200MII.
Trellis coded 19,200bps, four-wire, leased line ultra high-speed modem. Highest data transmission rate on the market today.

C&C
Computers and Communications

It doesn't matter if your business is livestock or over-the-counter stock, the last thing you need to worry about when you're sending information is not only that it arrives, but it arrives on time.

In today's competitive business climate, the speedy and reliable transfer of information can make or break a company.

That's why any time you transfer data via modem, you should transfer that data on a reliable modem.

A modem that also gives you performance, expandability and ease of operation.

solete as SNA evolves. "The goal of publishing our architectures and SAA is to help customers understand which architectures they should use to connect IBM and other vendors' equipment to an SNA network," Holland notes.

IBM stopped publishing some interfaces in readily available manuals and now publishes them only in proprietary product manuals.

Critics disagree and say the company's pledge of openness is nothing more than a series of calculated moves to maintain its dominant position in the market. Atul K. Kapoor, vice-president at Kaptronix, Inc., a Haworth, N.J., consulting firm, says IBM isn't opening all its architectures. He says the computer giant has made it more difficult for competitors to develop front-end processors for SNA networks. Vendors such as NCR Comten, Inc. and Control Data Corp. still have to do a lot of reverse engineering to produce their equipment because IBM stopped publishing interfaces in readily available manuals and now publishes them only in proprietary product manuals.

According to David L. Terrie, an independent consultant and editor of "Patricia Seybold's Network Monitor" newsletter, "IBM is trying to have its cake and eat it too. The company is publishing many of its networking specifications and telling other vendors to develop SAA products. But IBM refuses to license any code to these vendors." By contrast, he says, Sun Microsystems, Inc. not only publishes its interfaces but licenses its code to competitors.

By not licensing its code, IBM can control SNA's evolution and ensure that it will always enjoy a comfortable lead in developing new products. Since other vendors must wait for IBM to publish its interfaces, IBM can experiment with the interfaces before they're released.

IBM says there's an inherent time lag between developing and publishing architectures. While it admits that this lag can function as a competitive edge, IBM claims the lag stems from other considerations, such as an architecture's stability. "Part of the commitment to openness is making sure the standards are stable and the company is committed to using them in future products," Holland notes. "That process takes time."

Doll buttresses this claim. "When a company controls a set of standards," he says, "it has to understand them before they can be opened up to the rest of world. No one could get clobbered worse than IBM if it did sloppy job in implementing a standard. IBM could be sued. That threat is one reason the company is almost paranoid about its architectures and puts its protocols through rigorous testing procedures before unveiling them."

However, Doll also says, IBM's pledge to openness is far from a complete undressing of SNA, and many IBM architectures remain proprietary and closed. The company hasn't opened up its wiring and cabling schemes, net management in the Token-Ring Network or Rolm Corp. telephone sets, and "there are a lot of questions about how open the new PC Operating System/2 will be," he says.

In the second criterion of openness, OSI, IBM has

Continued on next page

A modem that's made by NEC.

Because no other company offers communications and network managers such a quality range of modems with operating speeds from 300bps to 19,200bps.

NEC also produces the Network Control and Management System (NCMS™)—a powerful and user-friendly troubleshooting and diagnostic tool that enhances day-to-day network operations and management.

NEC data communications products are produced by a company that's been in business for almost ninety years and intends to stay in business even longer. That means NEC customers are assured of continuing technical support and service when they need it, not when it suits the supplier's convenience.

It also means a guarantee that your communications systems and networks are delivering the right data to the right place at the right time.

So if you don't want your business waiting for the cows that may never come home, make sure your communications network transfers your data via NEC communications products.

If you would like more information on NEC Data Communications Products, please call 800-222-4NEC, or write NEC America, Inc.,
Data Communications Products,
110 Rio Robles, San Jose, CA 95134.

See us at TCA Booth #706 Annex.

NEC

From previous page

drastically changed its tune. Says Harry Tompkins, manager of telecommunications planning and engineering at Ciba-Geigy Corp. in Ardsley, N.Y., "During the last five years, IBM's commitment to OSI has shifted from benign neglect to active participation in the standards process." IBM has been an aggressive OSI product developer (see the chart on page 48) and claims it is one of the few vendors other than DEC that has announced products that conform to all seven layers of the OSI model.

IBM products that conform to the upper four levels of OSI are available only to European customers.

IBM's Hancock explains: "Is OSI the basis for networking? No. You can use it as part of your networking solution, but you have to build a whole lot on top of it, and then when you're finished, you're proprietary again. OSI is meant to be an interconnection point between networks — and the assumption is, in most cases, proprietary networks — provided by vendors such as IBM and others.

"Do we intend to abandon SNA and use the OSI protocols instead? No, because it is our view that it is not technically superior. Is OSI adequate for interconnection? Yes, and that's where we're going to implement it," Hancock continues. "We want to use OSI as a mechanism for our customers to have access outside of the SNA network while still using SNA networking to run their networks."

Ciba-Geigy has DEC and IBM equipment on a corporate network that links the Ardsley office with the company's home office in Switzerland.

Tompkins rated IBM's OSI products as equal and in some cases superior to DEC's offerings.

"DEC's packet-switching products lack functionality such as automatic restart and redialing capability and security," he says. "IBM is well ahead of it in those areas."

Dearth Vader

Behind the mask of OSI acceptance, IBM has erected a few roadblocks for customers, the most significant being a dearth of OSI products in the U.S. Currently, IBM sells only products that conform to the lower three layers of OSI in the U.S.

Products that conform to the upper four levels are available only to European customers. Repeatedly, IBM has stated that demand for OSI products is being driven by European, not U.S., customers.

"There is much more of a requirement in Europe for customers, in some cases mandated by governments, to install products based on OSI," IBM's Hancock says.

Donald A. Gladstone, program manager at IBM's OSI Project Office in Research Triangle Park, N.C., says OSI product development is in its infancy, and U.S. companies' interest in OSI is casual and just beginning to mushroom.

A case in point is a recent decision by one large IBM customer to revamp its network. Ron Cook, senior vice-president at E.F. Hutton & Co., Inc. in New York, says, "OSI played a very minor role in our company's purchase decisions. We've worked with IBM for more than 20 years and un-

Continued on page 48

What's the NEW Score in Distributed Matrix Switching?

		Data Switch	Other
1	Does the vendor offer a true *distributed* matrix switch (versus an electronic patch panel)?	Yes	
2	Is the distributed switch fully operational at the maximum announced matrix size when all satellite switches are attached?	Yes	
3	Are there any documented problems with the control software, resulting in inability to control the switch?	No	
4	Are systems being delivered to customers as promised, or have shipments been delayed?	Yes—on time	
5	How many latest-generation distributed switches have been shipped to customer sites?	200+	
6	Can references be contacted, with sites visited?	Yes	
7	How large is the vendor's in-house service organization?	75	
8	Is local customer service available from vendor's in-house organization?	Yes	
9	Is performance monitoring integrated in the distributed matrix switch?	Yes	
10	How much distance does the switch allow between DTE and DCE?	600'	
11	Does the switch provide V.35 support with no sacrifice in RS-232 ports?	Yes	

Now up to 1,600 feet with fiber-optic port group extension!

And—we now support up to 4,096 ports.

It's time to add up the score in the distributed communications matrix switch marketplace. Tear out this ad, and compare the capabilities and availability of competitive distributed switching systems with the proven criteria established by our Data Switch *Galaxy-Plus.*

At Data Switch, we know that *Galaxy-Plus* is the most advanced, *proven* switch available today. And, we know that no competitor within our markets can match the service and support we offer.

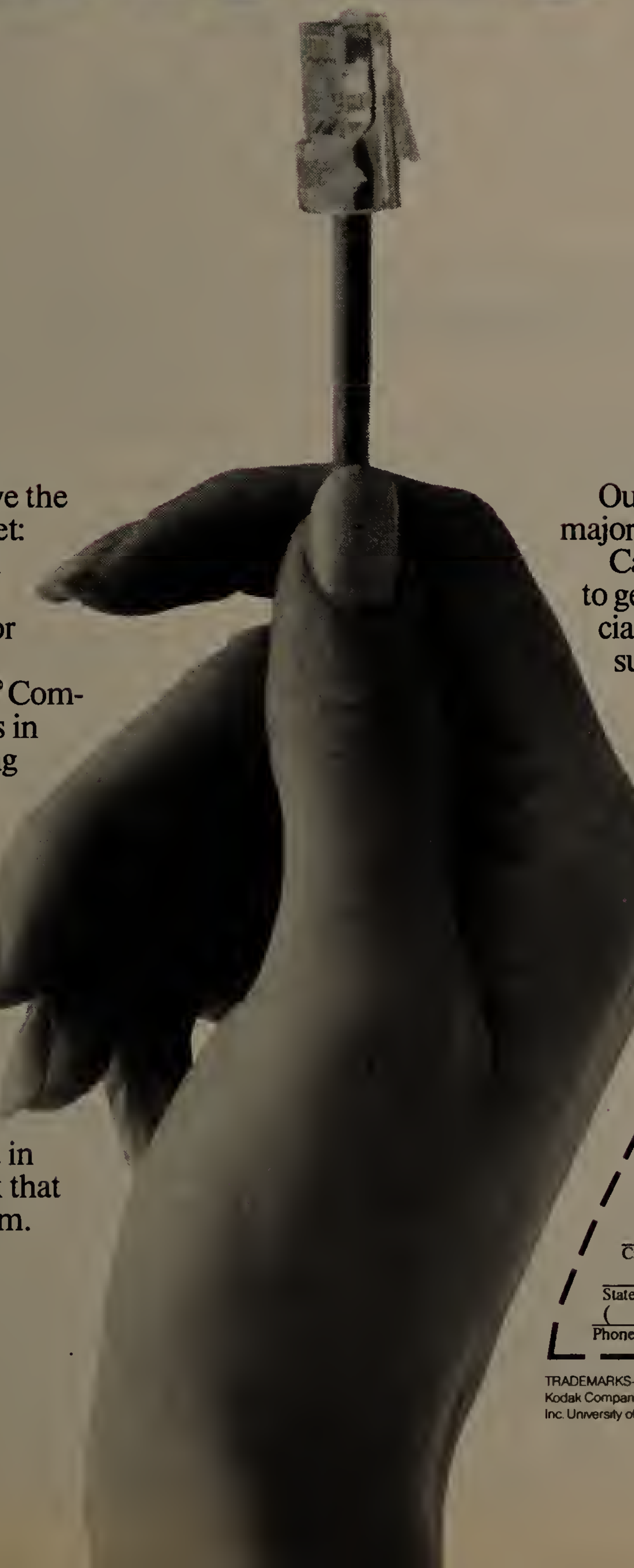
Prove it to yourself. Try to find any competitive switch that matches the 11 evaluation criteria set by *Galaxy-Plus.* Then call our Data Path Management Specialists at **1-800-328-3279**; in Connecticut, 926-1801; or write Data Switch Corporation, One Enterprise Drive, Dept. 30, Shelton, CT 06484. We'll be pleased to demonstrate that *Galaxy-Plus* stands alone as the only choice for your data communications network application. At Data Switch, we deliver on our promises.

DATA SWITCH CORPORATION

DATA SWITCH
T-BAR
INTELLINET
CHANNELNET

The Data Path Management Company

SURPRISINGLY, THE BEST WAY TO RUN ETHERNET IS ALSO THE EASIEST.



If you have a telephone, chances are you have the right cabling already installed to run Ethernet: *unshielded* twisted pair cable. Yes, the modern cabling you're probably already using for telephone and data communications now, for the first time, runs Ethernet at *10 Mbs.*

The reason is LattisNet® from SynOptics® Communications. The result is enormous savings in money, time and trouble for anyone installing an Ethernet local area network.

You'll avoid paying for miles of expensive coax cable. Avoid the noise, construction, disruption and downtime of installing it. And avoid the high cost of subsequent moves and changes.

LattisNet even comes with integrated Fault-Isolation and Diagnostics for instantaneous troubleshooting.

Our Connectivity Guide explains why the best way is also the easiest.

We should know. This is our second first in two years: LattisNet is also the only network that supports Ethernet on the IBM cabling system. And fiber optic cable as well.

The new *unshielded* LattisNet was the choice of Kodak, Novell, University of Wisconsin and many others.

© 1987 SynOptics Communications, Inc.

Our original LattisNet is installed in more than 60 major U.S. companies with a total of over 15,000 nodes.

Call or mail this coupon, or your business card, to get the LattisNet Connectivity Guide. You'll appreciate seeing why the best way to run Ethernet is so surprisingly simple.

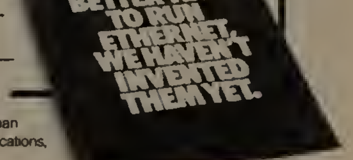
Call us at (415) 960-1100.

SynOptics
Communications, Inc.
Formerly Astra Communications

SynOptics Communications
329 North Bernardo Avenue
Mountain View, CA 94043
(415) 960-1100

☐ Send your Connectivity Guide to me immediately.
☐ Have a Sales Representative call me directly.

Name ____________________
Title ____________________
Company ____________________
Address ____________________
City ____________________
State __________ Zip __________
Phone (   ) ____________________


IF THERE ARE BETTER WAYS TO RUN ETHERNET, WE HAVEN'T INVENTED THEM YET.

TRADEMARKS—IBM: International Business Machines Corporation; Kodak: Eastman Kodak Company; Novell: Novell, Inc.; SynOptics and LattisNet: SynOptics Communications, Inc. University of Wisconsin: University of Wisconsin

From page 46

derstand that anything we want to buy will be supported either by IBM or a third-party vendor. IBM may not always conform to the standards, yet everyone else conforms to IBM. If a vendor wants to sell communications equipment, it will play IBM's game."

Other IBM customers have a different view. Ciba-Geigy's Tompkins says, "I take exception to the statement that U.S. companies aren't interested in OSI. There are a lot of U.S. companies with X.25 networks, and there's no real difference in customer networking requirements here and in Europe. We want the same level of connectivity. U.S. customers are often viewed as poor relations to our European counterparts."

Large IBM customers such as Citicorp, Aetna Life & Casualty Co. and The Boeing Co. have joined the Corporation for Open Systems, an organization formed to establish OSI testing suites. Obviously, these companies are interested in OSI products. Also, few companies are completely domestic. Most support at least a few international offices and are interested in products that could link those offices to domestic networks.

IBM says its decision to limit OSI product availability is driven by support and implementation issues. IBM's Gladstone notes, "We would rather introduce a product where demand is greatest, gain experience and then make the product available to other sectors."

The company says its OSI products will eventually become available in the U.S. and SAA will evolve to include OSI protocols where appropriate.

Despite the hindrances, Tompkins says, "we feel comfortable that IBM is taking OSI seriously and that it is here to stay. No vendor has strong offerings at all layers yet. IBM sees an opportunity to move in and grab the high ground, which will not be easy."

Forcing SNA into OSI

Kutnick says IBM's recent emphasis on openness came from enlightened self-interest. He notes, "SNA is being opened not because IBM wants to open it up but because the company wants to garner more support for SNA. With OSI being pushed hard by other vendors, IBM has to get more critical mass support for SNA so it has a better chance of forcing parts of SNA into the OSI model."

The issue of incorporating SNA protocols in OSI has come up three times. When OSI was being developed 10 years ago, IBM offered its SNA architecture as the blueprint for the OSI model, an offer that was rejected. IBM has twice offered its LU 6.2 protocols for inclusion in the OSI model, an issue that's still pending.

Kutnick says that if LU 6.2 were included in OSI, third-party vendors would have to develop only one set of peer-to-peer protocols that would work with both SNA and OSI. Competitors appear to resent IBM's attempt to contribute to the standards process, and some reportedly boasted of their ability to cut off IBM at the pass both times the issue of LU 6.2 came up.

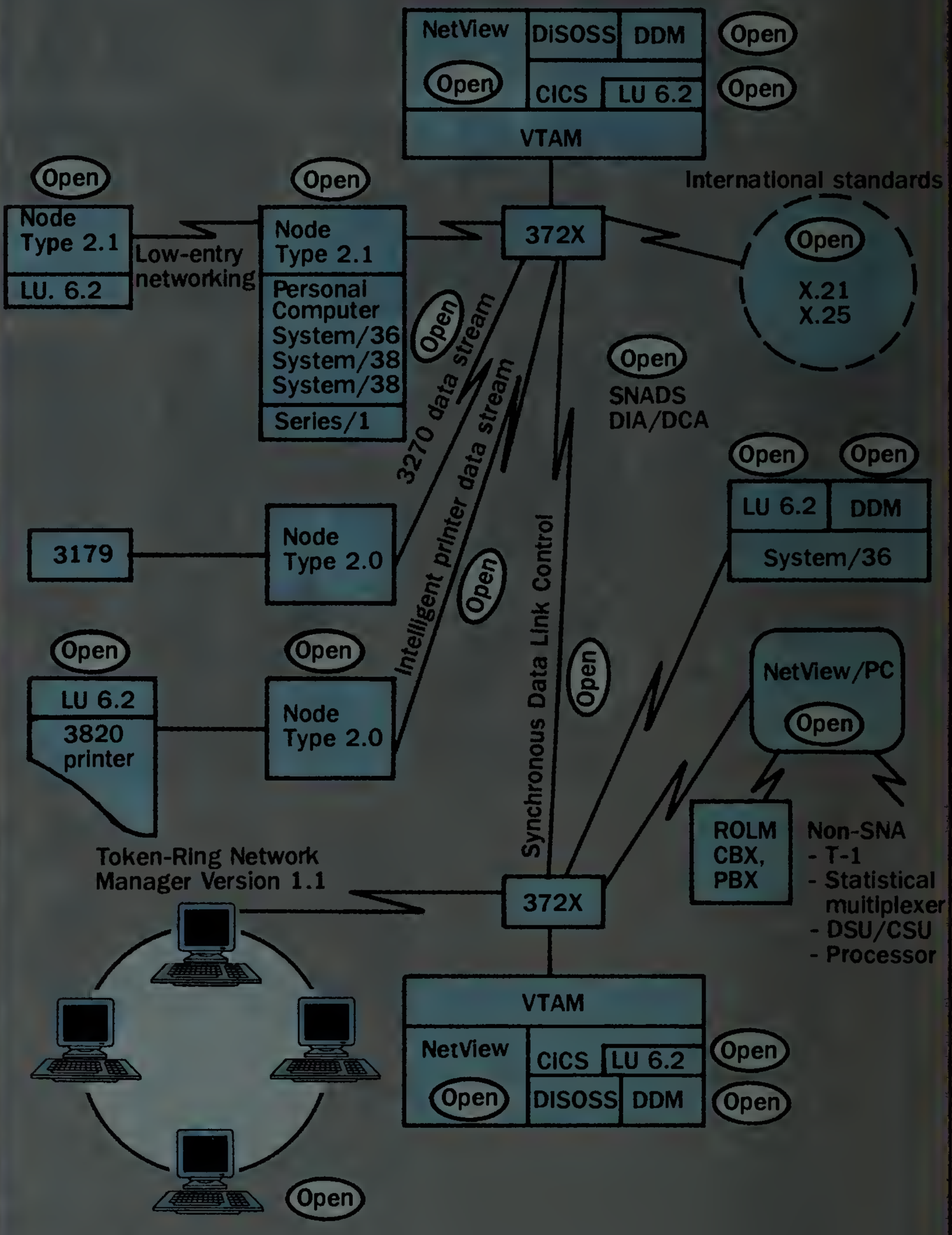
IBM Open Systems Interconnect (OSI) products

FTAM Programming Request for Price Quotation (PRPQ)	Supports MAP 2.1 FTAM on MVS in conjunction with MCS. Available only in U.S. (Layer 7)
X.400 Message Transfer Facility	Message transfer agent between VTAM and X.400. Available in Europe in September 1988. (Layers 6 and 7)
X.400 DISOSS connection	Conversion facility between DISOSS and X.400. Available in Europe in September 1988. (Layers 6 and 7)
MAP Communication Server (MCS)	Supports MAP 2.1 on Series/1 RPS. Available only in U.S. (Layers 3 to 7)
MAP Application Server	Translates SNA protocols to MAP 2.1 protocol. Available only in U.S. (Layers 3 to 7)
General Teleprocessing Monitor for OSI (GTMOSI)	Session manager that communicates with VTAM, FTAM, X.400, OTSS, OSNS, CICS, NCP, NPSI, TSO, MSNF and IMS. Available only in Europe. (Layers 4, 5 and 6)
Open Systems Transport and Session Support (OTSS)	MVS, VSE or VM application that supports selected OSI transport and session-layer protocols. Available only in Europe. (Layers 4 and 5)
Open Systems Network Support (OSNS)	MVS or VM application that manages NPSI virtual circuits over packet-switched network. Available only in Europe. (Layer 3)
Communications and Transmission Control Program (CTCP)	Application for initiating SNA sessions with NPSI gateway. (Layers 1, 2 and 3)
NCP Packet-Switching Interface (NPSI)	Front-end processor connection that provides SNA path information through packet-switched network for IBM mainframes. (Layers 1, 2 and 3)
Integrated X.25 adapter	Supports X.25 emulation on remote Series/1, System/88 and 5251 cluster controllers or local System/36 and System/38. (Layers 1 to 3)
MP-500 MAP interface	Lets IBM Personal Computers connect to IBM Token-Ring Networks running MAP 2.1. Available only in U.S. (Layers 1 and 2)
Short Hold Mode/Multiple Port Sharing (SHM/MPS)	Hardware for the 4361 mainframe, System/36 and Series/1 to provide X.21 connection. (Layer 1)

FTAM = File Transfer and Access Method
IMS = Information Management System
MAP = Manufacturing Automation Protocol
MSNF = Multisystem Networking Facility
NCP = Netwcrk Control Program
RPS = Real-time Programming System
SNA = Systems Network Architecture

SOURCE: IBM, RESEARCH TRIANGLE PARK, N.C.

IBM Open Communications Architectures and Open Network Management Architecture



OPEN = IBM publishes interface specifications so that users or third-party vendors can emulate the functions contained in that product or architecture.
CBX = Computerized Branch Exchange
DDM = Device descriptor module
DIA/DCA = Document Interchange Architecture/Document Content Architecture
DSU/CSU = Data service unit/channel service unit
PBX = Private branch exchange
SNA = Systems Network Architecture
SNADS = Systems Network Architecture Distribution Services

SOURCE: IBM, RESEARCH TRIANGLE PARK, N.C.

IBM's Gladstone says other companies, such as AT&T, freely contribute to the standards process. But whenever IBM offers, competitors look for ulterior motives.

IBM appears willing to share its SNA development work with OSI committees. The company has aggressively tackled network management issues associated with multivendor environments. Kutnick and other analysts deem network management IBM's key to differentiating SNA from OSI.

IBM doesn't share that view. When asked for further items that IBM may be willing to submit for inclusion in OSI model, Gladstone mentions network management. "OSI network management tools are almost nonexistent today," he says.

"Conceptually, NetView and the OSI network management standards are very close. The standards body could either create its own network management tools or choose to incorporate portions of NetView. Right now, there are no definite plans to offer any sections of our network management architecture to OSI committees, but it is a possibility."

IBM would gain more than it would lose if NetView were included in the OSI model. "The key question," Kutnick observes, "is not 'How open is SNA?' but 'What is the overhead for another vendor to attach its devices to an SNA network?' Competitors have to layer IBM products on top of their own products."

To support NetView, for example, network management vendors have to develop special software that links their devices to NetView.

In addition, each vendor's networking scheme incurs additional overhead because it must support two different network management systems.

Consequently, IBM networking products should supply better performance than competitive products.

That little edge may hold the key to IBM's open systems strategy. The company realizes that the days of the True Blue IBM shop are numbered and that customers plan to build multivendor networks and need standards to do so.

By establishing its networking products as either de facto or industry standards, IBM will ensure that it supplies a significant number of pieces for those networks.

▶ *FINANCIAL NETWORKS*

Investing in the future

The Canadian Imperial Bank of Commerce is merging resources and paving electronic roads to reach customers.

BY LLOYD REAUME
Special to Network World

How do you build an electronic highway strong enough and long enough to transport an $87.9 billion institution into the future? The Canadian Imperial Bank Of Commerce (CIBC) intends to build one with thoughtfully implemented technology that gets transactions off paper, out of the mails and into electronics.

CIBC is a nationwide bank with 1,630 branches, offices, agencies and subsidiaries serving Canada and 23 other countries. The bank employs 33,914 people, 7.4% of whom work outside Canada. One measure of its vigor is the $50 million per annum that outsiders estimate the bank is allocating to its 2,600-person Management Services Group to get its electronic highway built.

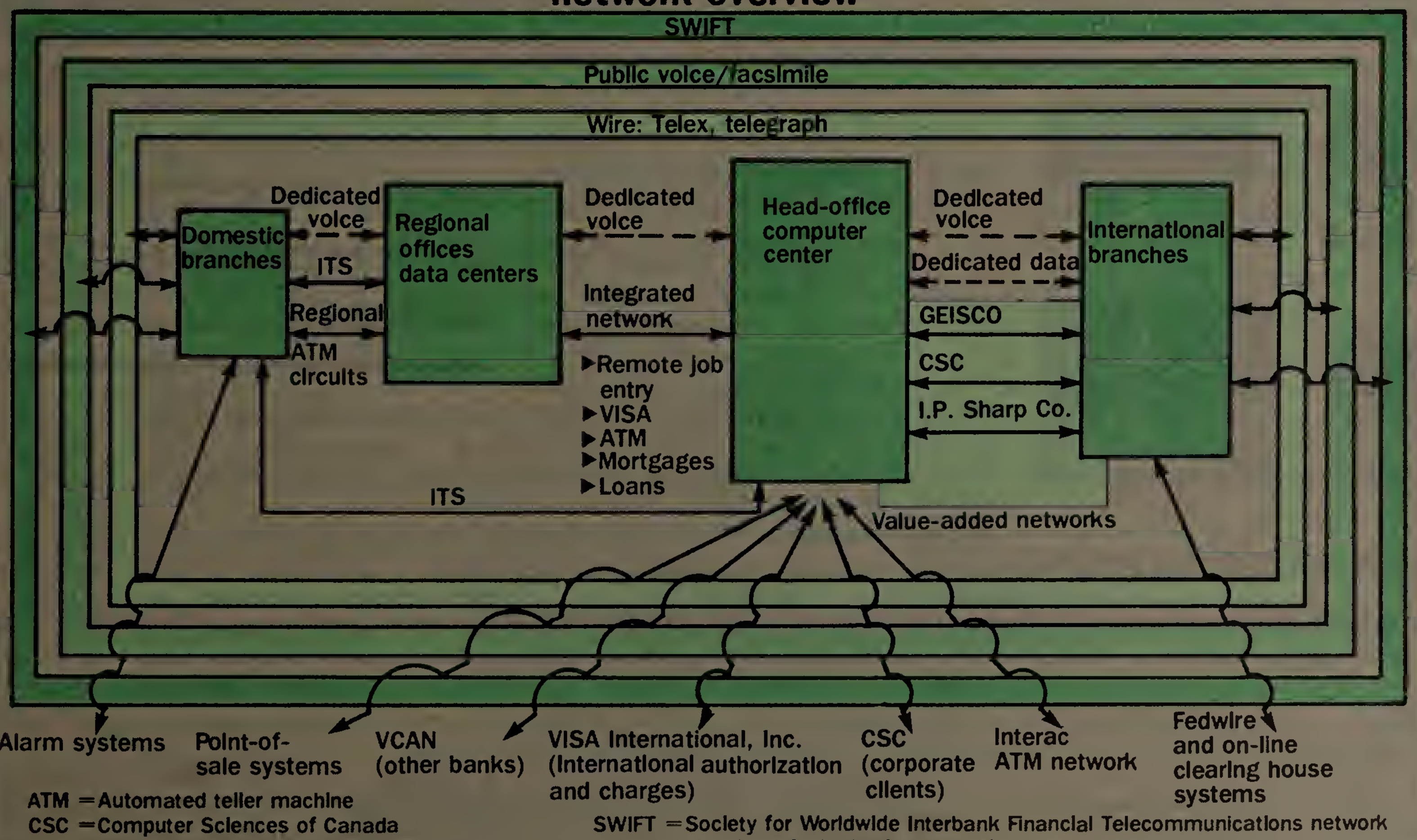
When asked where that highway is heading, Brian Mikulin, assistant general manager of communications planning, has an explicit answer: "To an environment in which the people who represent the bank to the public can truly function as customer service people."

Donald M. Dowie, vice-president of communications in the Systems Division, comments on the bank's drive to upgrade its voice and data facilities, "The bank is primarily in the information business, and it must meet the three objectives of speed, integrity of data and security of information. In our environment, there are many applications in which centralized corporate data has to be disseminated to all of our foreign and domestic locations. Our current strategy is to up-

Continued on next page

Reaume is a freelance writer based in Nepean, Ontario.

Canadian Imperial Bank of Commerce network overview



ATM = Automated teller machine
CSC = Computer Sciences of Canada
GEISCO = General Electric Information Services Co.
ITS = Intelligent Terminal System
SWIFT = Society for Worldwide Interbank Financial Telecommunications network
VCAN = Visa Card Authorization Network

SOURCE: CANADIAN IMPERIAL BANK OF COMMERCE, TORONTO

From previous page

grade existing facilities and services in all areas, including voice, data, image and wire services."

Banking on PCs

The first major step on this journey was the changeover from a dedicated, mainframe-based banking system with dumb terminals to a networked, personal computer-based information system. From 1980 through 1986, CIBC installed a corporate information network of 8,000 personal computers and 2,000 IBM Personal Computers and Personal Computer ATs.

CIBC calls the new network its Intelligent Terminal System. The diskless personal computers act as the fundamental terminals at teller or other customer service locations. These are connected through personal computer cluster networks to the AT-level machines, which act as controllers for the diskless machines. Each controller serves several personal computers, according to Mikulin.

The controllers are linked to regional processing centers via dedicated 4.8K bit/sec data lines. At the regional centers, the information flows into IBM 3725 communications controllers, which act as front-end processors for the IBM Personal Computer ATs as well as for transaction information from other sources such as automated teller machines.

Information is then transmitted to CIBC's head office in Toronto by way of high-speed 19.2K bit/sec lines and into the IBM 3090 mainframes.

Strategic reasons dictated the seemingly radical changeover to a personal computer-based network. Replacing multiple dedicated terminals with one personal computer reduced costs and permitted easier access to pertinent customer information by customer service staff.

Furthermore, the personal computer network opens the possibility of interacting with thousands of corporate customers who are equipped with personal computers. Such corporate banking services will be dial-up public networks with multiple gateways, which predominate in Canada more than they do in most parts of the U.S.

The move to a personal computer-based network gives CIBC the best of two worlds. On one hand, it can now use, communicate with, and shop in the vast IBM-compatible personal computer equipment market. On the other hand, it gains a strategic advantage in providing fee-based financial services.

> CIBC is currently replacing about 300 telephone systems per year — that would be large scale even for GM.

Mikulin explains, "We are looking for new markets, and the fee-based financial services market is growing at the moment and offers room for CIBC to expand. CIBC believes that properly harnessed technology gives an important competitive edge; it enables convenient and timely delivery of customer services and improves operating efficiency."

> Strategic reasons dictated the bank's seemingly radical changeover to a personal computer-based network.

Banking on voice

As part of their road map to the future, CIBC is currently replacing about 300 telephone systems per year — that would be large scale even for General Motors Corp. The equipment being replaced ranges from key systems to private branch exchanges and switching equipment.

The reasons vary according to each site, but the common needs are for increased capacity, better call-handling capability and the ability to choose the most cost-effective carrier services.

Jurisdiction in Canadian telecommunications is divided between the federal government and the 10 provincial governments. Most of the major telephone operating companies belong to an association called Telecom Canada that coordinates their services nationally. Equipment used by bank offices and branches typically includes offerings from Rolm Corp., Mitel, Inc. and lots of Northern Telecom Ltd. gear.

CIBC finds Centrex services to be of reasonable quality, appropriately tariffed and convenient to use. The use of Centrex III in larger locations reflects the bank's predilection for benefiting from communications technology with minimal involvement in the nuts and bolts of maintenance and administration. In some instances, Centrex is used in combination with PBX equipment. One example given by Mikulin is a Rolm Computerized Branch Exchange (CBX) with trunk lines running from the CBX into the local telephone company's Centrex facility. "We use a variety of products, depending on the need and economics," Mikulin says.

Banking on data

CIBC has designed and implemented a standard architecture for data handling, and no branch can alter this without the concurrence of the head office. This architecture consists of a configuration of intelligent devices normally linked on-premises by a local-area network and controlled by IBM Personal Computer ATs.

The intelligent devices usually fall into three categories: diskless personal computers dedicated to banking services, disk-driven personal computers connected by the local network for general purpose support within the branch and ATMs.

Carrier choices for external data communications depend on what is available at branch locations. CIBC locations in the U.S. usually have access to multiple carriers, with the resulting choices and potential headaches from varying tariffs and capabilities.

> CIBC has designed and implemented a standard architecture for data handling.

Multiple-carrier situations normally exist throughout Canada, although until recently it was normally Telecom Canada vs. Canadian National/ Canadian Pacific Communications, each with land lines and microwave installations. More value-added carriers, such as Computer Sciences of Canada and I.P. Sharp Co., are appearing. These carriers often lease large amounts of bandwidth from the two main competitors and compete by adding special services, such as time-sharing capabilities and network capacity. They also purchase excess bandwidth from satellite communications companies and compete with land lines in long-haul data communications.

System architecture is a primary data transmission concern. "One of the key things we're trying to do is maintain compatibility and flexibility between systems," Mikulin says. CIBC liked the features of the Canadian On-Line Teller (COLT) system used on its mainframe and has begun "evolving" COLT into its own Commerce On-Line Information Network System (COINS) architecture. IBM, developer of the COLT system, is assisting CIBC with the software redevelopment. CIBC's Dowie explains that the bank would rather go this route than convert the whole system to third-party-developed software.

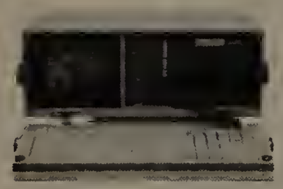
"We have retained the COLT software, which we are upgrading in conjunction with IBM, to add such functions as accessing electronic mail and a variety of other information services," Dowie said. "We have a natural reluctance toward software conversions because of the huge task involved."

The personal computer-based COINS supports all internal bank transactions. All savings and checking accounts are on-line, and a variety of mainframe-based information services are accessible by customer service representatives through COINS.

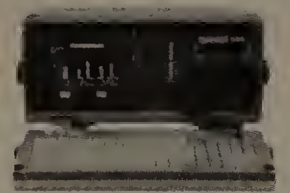
One such service, the Integrated Wire Service (IWS), should be implemented companywide by late 1987. IWS is based on a package developed by Data Architects, Inc. of Waltham, Mass., that was modified by CIBC after purchase. The package marries telecommunications to payment transactions using Tandem Computer Corp. equipment, providing an interface between branch banking software and various telecommunications carriers for transactions between banks or between CIBC third parties.

Payment transfer mes-

Continued on page 52


Digilog 300

Digilog 400


Digilog 600

Digilog 800

We've got your number

One of these four protocol analyzers is just right for you

Each model offers you a distinct solution. Yet, as a family, they are all compatible . . . software, disk, remote control, and operationally.

In a national survey of data comm professionals, 53% named these Digilog analyzers as their ideal.

Digilog analyzers are ideal for field service, network diagnostics and test, software development, and network optimization and planning.

3-YEAR WARRANTY
Call toll free
800-233-3151
In PA, 215-628-4530

DIGILOG®

Leading in Data Communications Test and Control

"See us in Booth 404 at the TCA Show"

Another in a series of CLEO user applications

"Thanks to CLEO, we were the first company accepted by the IRS for electronic transfer of tax returns."

1040 U.S. Individual Income Tax Return 1986
Profit or (Loss) From Business or Profession
U.S. Individual Income Tax Return
Capital Gains and Losses and Reconciliation of Forms 1099-B
Supplemental Income Schedule
CLEO makes the MAINFRAME connection
CLEO data communications products since 1976
CLEO

CLEO has been providing solutions to remote sites communication problems for years. Here is a typical example:

"...We expect reasonable vendor service, of course. But in this case, we were under a rapidly approaching IRS deadline, and we needed assistance 'yesterday'. To make matters worse, the problem occurred over the Christmas period."

"...With two CLEO Syncmodem 208 devices and CLEO 3780Plus software, we got the job done. To date, we have processed over 4,100 returns to the IRS."

"...The performance of the CLEO modems and software has been flawless."

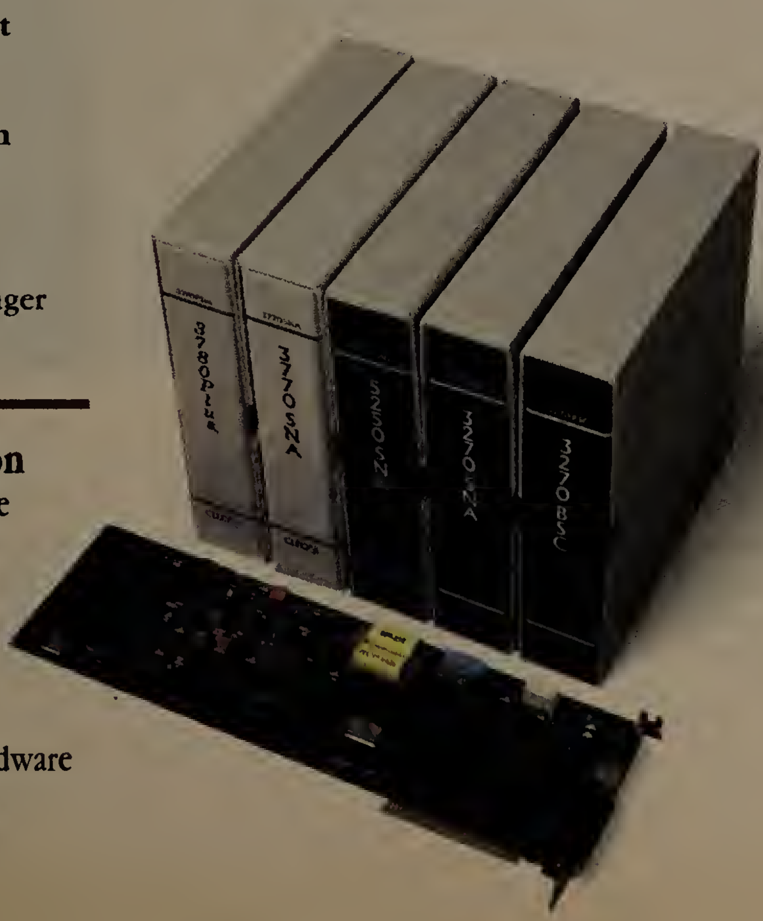
"...I can honestly say that we would not have been the first company accepted by the IRS for electronic transfer of tax returns had it not been for the prompt, patient and knowledgeable assistance of CLEO."

John T. Hewitt, General Manager
Mel Jackson, Inc.
Virginia Beach, VA

Remote Sites Communication

Whatever your industry, your remote computers need to share information with your mainframe. Or, they need to exchange data with other remotes. In either case, you need a total solution at the remote sites. You need software, hardware interfaces and modems that all work together smoothly. You need CLEO!

CLEO software products allow microcomputers to communicate with minicomputers and mainframes, and to emulate their workstations. Since 1981, CLEO has provided remote communications between micros and mainframes for the automotive, insurance, medical and banking industries. Today over 44,000 CLEO users worldwide are running on all major brands of microprocessors. The greatest number of these users run CLEO software on IBM Personal Computers and NETBIOS LANs.



Complete Software/Hardware Package

Every CLEO package contains all the software and hardware accessories needed at the remote site. Your selected CLEO, SNA or BSC software is packaged with 1) an internal modem card for dial-up applications, or 2) an interface card and cable for use with your existing modem. There's no waiting for non-CLEO add-ons. And, you get prompt, single-source service. Package prices range from $995.00 for most stand-alone packages, up to $2,995.00 for the 32-user SNA gateway.

Call us today to discuss your application.

CLEO Software
1639 North Alpine Rd.
Rockford, IL 61107
Telex 703639

Headquarters:
USA: **800/233-CLEO (2536)**
Illinois: 800/422-CLEO (2536)
International: 815/397-8110

Sales and Distribution:
Eastern U.S.A.: 800/433-CLEO (2536)
In Michigan: 313/540-4600
Western U.S.A.: 800/553-CLEO (2536)
In California: 213/618-0813
Mexico City: 203-0444
Canada, East: 800/361-3185
Canada, West: 800/361-1210
Canada, Montreal: 514/737-3631

CLEO®

CLEO and 3780Plus are registered trademarks of CLEO Software. IBM is a registered trademark of International Business Machines Corporation.

From page 50

sages entering IWS are queued on the system 24 hours a day, seven days a week. Transactions are retained on-line for a period of 20 business days and then sent to a microfiche facility.

This system decreases the manual steps in the payments operation, ensures greater accuracy and provides complete documentation of transactions. Although not yet available to all CIBC offices and branches, an average of $8.5 billion per day already flows through IWS. When IWS is fully integrated with COINS, transactions will proceed from a customer service representative's terminal to almost any point in the CIBC universe, with a response obtained quickly through IWS to COINS — all without rekeying any information.

SWIFT change

A service called SWIFT has been influential in helping CIBC gear up for its new electronic highway. The Society for Worldwide Interbank Financial Telecommunications (SWIFT) is a cooperative society that was formed in Brussels in 1972 by 238 member banks, including CIBC. SWIFT now has 1,361 members in 61 countries.

Messages are sent over SWIFT using Swiftware protocols. To member banks, these messages have the same status as paper checks. System security includes message encryption, mandatory positive acknowledgment of receipt and test keys within each message to discourage tampering.

When a message recipient is unable to accept the transfer for any reason, the message is held in the SWIFT network until it is received. However, the onus to receive a transfer of funds is on the recipient from the moment that SWIFT acknowledges existence of the transfer. CIBC averages 7,000 global messages per day via SWIFT.

SWIFT is currently upgrading its facilities worldwide. The new SWIFT II will offer enhanced equipment and more processing capabilities, Mikulin says, adding that CIBC plans to take advantage of SWIFT II as soon as it's available.

A service called SWIFT has been influential in helping CIBC gear up for its new electronic highway.

Banking on ISDN

While conceding that the widespread use of Integrated Services Digital Networks is still several years away, CIBC assumes that ISDN inevitably will be achieved in some form. Therefore, company communications policy states that besides gaining immediate operating efficiencies, telecommunications changeouts should prepare for ISDN. Mikulin looks at ISDN as a "longer-term objective.

"We are trying to make allowances for that future requirement, instead of just going with minimal needs and not worrying about compatibility down the road," he says.

"Whenever possible, we try to ensure that our suppliers indicate to us that they're planning to support ISDN, to be compatible to standards that promote open systems interconnection. If they tell us 'we have no plans to conform to the ISDN model,' then they will be looked upon less favorably."

In 1986, CIBC reorga-

You can't manage a bu
don't leave you

It's not just how you manage your business, it's how you manage your business in the long run.

Specifically, if you're not managing information with a long-term strategy in mind, you might run into problems later on—problems that may be costly to resolve.

AT&T comes through with a full range of options to keep pace with your business.

Considering this notion, AT&T designed an "open-ended" approach to information management solutions. This gives you the freedom to use AT&T equipment with most other vendors' equipment—which means you'll avoid the problems that can come up when you're locked into just one vendor.

Chances are, you've heard other vendors talk about connectivity and flexibility, but the problem is, it's within their own system. At AT&T, we offer it from one system to another.

Since we take a communications-based approach, our design will allow you to move information around the world linking people, companies and continents. Therefore, it has the flexibility to offer you a variety of options to customize your information system as your business grows and changes.

With our communications expertise, we're able to extend communications control and the power of the AT&T Network into your own hands. Using an AT&T PBX and our departmental computer capabilities, our design will free your mainframe computers from managing communications—allowing them to do the tasks they were meant to do.

And to make service as efficient and complete as present-day technology will allow, you'll also have the capability of end-to-end network management.

In short, our open-ended solutions will allow information to be readily available and give you the flexibility you need to handle your business now and in the future.

So before you choose a company to manage your information networking needs, consider your options.

Because somewhere down the road, you don't want to find yourself painted into a corner.

For more information about our open-ended

© 1987 AT&T

nized to deliver fee-based services more effectively in three areas: to the individual, to corporations and within the global financial community.

■ **Serving the individual.** CIBC is working with others in the Canadian banking industry to capture a share of consumer transactions through cooperative action in electronic banking. CIBC ATMs are linked with over 3,600 ATMs across Canada through the Interac network. Similar to the Plus and Cirrus networks in the U.S., Interac ATMs allow credit card or bank card holders to withdraw funds at ATMs throughout the nation. This cooperation extends to the U.S., where ATMs displaying the Visa logo honor Visa cards issued by Canadian banks. The Visa Card Authorization Network (VCAN) works in much the same manner.

> CIBC automated teller machines are linked with over 3,600 ATMs across Canada through the Interac network.

■ **Serving the corporation.** The personal computer-based COINS puts CIBC on the threshold of direct connectivity to a multitude of personal computers in the corporate world. Enabling corporations to initiate, monitor, receive and confirm transactions using in-office terminals would bring undeniable mutual benefits to banks and clients.

■ **Serving the traders.** CIBC is keenly aware that the global money market is a hyperaggressive environment in which technological innovation can play a crucial role.

Dowie sums up the operational and recruitment aspects succinctly, saying, "In this milieu, where instant access to information in terms of quotes or reports is everything, response in terms of subseconds is critical. The best tools attract the best traders."

To stay competitive and perhaps gain an edge on the other institutions, CIBC has developed a functionally integrated voice/data workstation for use by its own foreign exchange and money market traders.

Each workstation displays multiple screens, each with its specialized information source (for example, Reuters or Telerate). The workstations also employ telephone turrets with 23 lines, giving traders access to 20 to 30 clients at the press of a button. The workstations are linked to the bank's internal computer systems and currently provide accurate currency exchange rates and other vital information. CIBC is including the workstations in new trading systems in Toronto, London and New York.

Driving to the future

Most banks want to know how technology can help them do the same old things better. Others, such as CIBC, are willing to invest great amounts of time, money and effort in technology that will bring both change and stability.

In his annual report to shareholders, CIBC Chairman and Chief Executive Officer R. D. Fullerton explained the bank's position: "Stability and change are not mutually exclusive. Change is essential . . . to meet the needs of customers, to capture the rewards of technology, to respond to evolving forms of competition and to participate in the global financial marketplace."

siness properly if you
options open.

information management solutions, talk with your AT&T account executive or, for the number of our office nearest you, call 1 800 247-1212.

From equipment to networking, from computers to communications, AT&T is the right choice.

AT&T
The right choice.

From page 40

political weight," he added.

Low-power lunch

Users groups are outspent by vendors in many areas besides PACs. In July, for example, James Olson, chairman and chief executive officer of AT&T, hosted a glittering dinner at the Corcoran Gallery of Art in Washington in honor of a new exhibit, "Three Generations of Wyeth Art," whose worldwide tour AT&T is sponsoring at a cost of $950,000. Senators, representatives and Reagan administration officials attended. A blurb in the society column of the *Washington Times* mentioned in passing that AT&T just happened to be in the midst of bidding on the $4.5 billion Federal Telecommunications System 2000 project.

Not to be outdone, Bell Atlantic Corp. a few weeks later put on a 1,200-person, black-tie dinner in front of Philadelphia's Constitution Hall for legislators and their families. The fete was part of a weekend celebration honoring the U.S. Constitution's bicentennial. Tom Healey, a Bell Atlantic spokesman, says the company spent $250,000 on the dinner and other affiliated events.

Users groups, by comparison, spend pennies on lobbying. Ad Hoc's Blaszak, for example, admits he has never taken an FCC commissioner to dinner, although he said he lobbies them in their offices.

Hank Levine, who represents CCTU, says he spends 75% of his time at the FCC with staff. "If we go out to lunch, it's for a sandwich, and it's Dutch treat," he says. "So much for the high-powered Washington lobbyist."

Besides representing CCTU, Levine works for other users groups such as the New York Clearinghouse Association, a group of 12 banks. All his clients oppose the FCC's recent proposal to impose an approximate $5-per-hour access charge on enhanced service providers such as Telenet Communications Corp. and Tymnet/McDonnell Douglas Network Systems Co.

Levine has been meeting on that issue with key decision maker Tom Sugrue, chief of the policy and program planning division of the FCC's Common Carrier Bureau. Six years ago, Sugrue and Levine picked up their paychecks at Wilmer, Cutler and Pickering, a Washington law firm. "We were colleagues and friends," Levine says.

But even FCC hall-crawling — the most elementary form of lobbying — is disdained by ADCU. "Nobody here sits on the laps of the FCC staff and blows in their ears," says John Compitello, chairman of ADCU's public policy committee.

Compitello says ADCU simply responds to notices of proposed rule making (NPR) put out by the FCC. "We see our role as telling them how real life is out here in the trenches," he explains, adding that Shirley Fujimoto, ADCU's representative at the Washington firm of Keller & Heckman, goes to the FCC only when the group doesn't understand an NPR.

Users groups claim successes

While users groups may lack political tonnage, they nevertheless have made headway in Washington. The ICA, in conjunction with AT&T and other groups such as EIA, formed a coordinated lobbying effort that was able to head off a similar effort by some of the RBHCs to get supervision of the Consent Decree transferred from Judge Greene to the FCC. Sen. Robert Dole (R-Kan.) proposed legislation to accomplish that in the fall of 1986. The bill went nowhere, thanks in part to the efforts of a coalition of about 50 user and vendor associations that lobbied against it.

A few years after the Consent Decree was finalized, the ICA fought AT&T at the FCC over access to AT&T's embedded phone equipment. "Their strong efforts to get the sale of equipment treated in a transitional plan were a major factor in it being treated that way," acknowledges AT&T's McGann, who denies AT&T was unalterably opposed to ICA on that issue.

ADCU's Compitello says the comments filed by his group convinced the FCC to exempt corporate private-line data users from access charges that were imposed on voice users.

It is difficult to judge precisely how much of a role users group lobbying had in winning these and other victories. Multiple factors are always at work when the FCC or Congress makes a decision. What makes the difference for users groups is the quality of their lobbying efforts. Because users groups are credible, and because they hire respected Washington representatives and arm them with convincing data, they sway federal policymakers with regularity.

"Despite the fact that people believe that the biggest bank account wins," Moir says, "the ICA is a living testament to the fact that that's not true. There are many who believe the ICA's views have been more representative of the broad public interest than people in government who have been mandated to protect and be motivated by the public interest."

BEFORE WE TRY TO SELL YOU A SINGLE T-1 MUX, WE'D LIKE TO LIST THE THINGS YOU WON'T GET.

You won't start from scratch.
The MultiStar family of T-1 multiplexers can be used with your existing equipment. Which means you can use a variety of inputs — asynchronous and synchronous data, voice, or digitized video — all on the same network.

You won't be the first.
Amdahl Communications has been a major manufacturer of data communications systems for nearly 20 years. Our systems are in place, moving data for some of North America's largest corporations.

You won't get boxed in.
Our systems are designed with unique flexibility. Features like DACS compatibility, multitrunking, clocking options, and software control, let you deal with network changes. Our multiplexers work with current T-1 services, but they are also designed with emerging services in mind.

You won't find yourself down and out.
Critical applications are nothing new to the MultiStar family. At the network level, the system automatically monitors link status, and at the hint of a problem, automatically re-routes data to an alternate path.

You won't get taken to the cleaners.
We can show you products that offer more features for the money than any in the industry. We think we have one of the best price-value stories anywhere. We're so sure, we don't mind if you shop around a little.

You won't become obsolete overnight.
Our modular architecture makes the MultiStar line easy to maintain and economical to expand. Equipment installed last year doesn't have to be tossed aside the next. Your network can be updated as new technology and services evolve.

You'll be making the logical choice.
Simply put, we think there's no better product available for the money. What's more, you can rely on a worldwide network of support and service – one of the best in the industry. We also offer a full line of other data networking equipment for all your needs.
Of course, now that you know what we won't do, we'd like to tell you more about the things we can do. Call us at **1-800-325-6029,** or in Texas **1-800-443-2414.**

The MultiStar family offers the best price/value buy in the industry, bar none.

amdahl®
The Logical Choice

Amdahl Communications, 2200 N., Greenville, Richardson, TX 75081
®Amdahl is a registered trademark of Amdahl Corporation

COMMUNICATIONS MARKETPLACE

TURN YOUR PC XT AT INTO MULTI-USER, ON-LINE SYSTEM

INFOHOST®

Multi-user On-line System Software
(Reviewed by PC Week on 5/19/87)

You can now place a database of goods and services on-line using your own PC, so your customers can dial in over phone lines to access information, leave messages, and make purchases via modem. InfoHost, which can support as many as eight simultaneous modem interfaces, features a customizable relational database that can be adapted to the needs of your business.

A-Comm Electronics, Inc.
377 Rte 17 So, Hasbrouck Hts, NJ 07604
(201) 288-7885 TLX: 4948376

CALL OUR DEMO 201-288-7792
(Modem Settings 8 1 N)

AT&T Cellular Mobile Phones

-- ***$899.00*** PLUS TAX --

INCLUDES *FREE* STANDARD INSTALLATION IN MASS.

- **Delivered UPS anywhere in the U.S.**
- **Installed by local authorized installer.**
- **Full 2-year warranty.**

Call **Arista Communications** ***Today!***

(617) 875-4888

** Foreign cars/sports cars may require additional charge.*

ARE SYSTEM/38 COMMMUNICATIONS LIMITING YOUR NETWORK PLANS?

CWA has announced and delivered an IBM solution to your problem.

The 3805 Network Controller provides the flexibility of a front end approach to communications processing. Because the 3805 offloads communications within a network environment, the System/38 has improved performance and increased com-line capacity. Modular implementation allows for easy expansion and addition of features. The 3805 is a total hardware and software solution for System/36 and System/38 networking problems.

Do you require these features?

- **Increased com-line capacity.**
- **Less expensive, more efficient host to host communications. (LU6.2)**
- **Improved response time.**
- **Multiple hosts sharing multi-point lines.**
- **Disaster recovery.**
- **More lines for dial-up support.**
- **Insulation of System/38 from line failures.**

For detailed information, call or write:

CWA International, Inc.
18805 Cox Avenue, Suite 200
Saratoga, California 95070
(408) 378-3414

MODEMS/TEST EQPT.

PURCHASE LEASE RENT

ALL MFRS AVAILABLE: NEW OR USED

PARTIAL LISTING OF LEASE RATES

MODEL	36 MO LEASE
CODEX CS9600 (PT. TO PT.)	$33.00
CODEX CS96FP (MULTIPOINT)	$33.00
CODEX 2640 (PT-PT OR MULTIPT.)	$99.00
AT & T 2096A & C	$79.00
UDS 208 A/B	$26.00
SPECTRON A/B SWITCHING PATCH PANELS	$127.00
AMCO EQUIPMENT CABINET	$35.00

OTHER MODEM MFRS AVAILABLE

IBM (LEASED LINE)
PARADYNE (LEASED LINE)
GDC (LEASED LINE)
UDS (DIAL UP)
CONCORD (DIAL UP)
RACAL-VADIC (DIAL UP)
ASTROCOM (LIMITED DISTANCE)
CODEX (ALL PRODUCTS)

OTHER TEST EQPT. AVAILABLE

TBAR
BRADLEY
DLM
SYMPLEX
DATAPROBE
HALCYON

CNS WILL ALSO PROVIDE:

CNS MAINTENANCE
MANUFACTURER'S MAINTENANCE
INSTALLATION SERVICES (NATIONWIDE)

CENTRON NETWORK SERVICES

a division of **Centron DPL Company, Inc.**

1-800-532-7532 ask for Tom Collopy

SAVE 40% TO 60% ON northern telecom AND ROLM

FROM THE COMPANY THAT TAKES THE RISK OUT OF BUYING RECONDITIONED EQUIPMENT.

Telesource

NOW— SAVE WITH CONFIDENCE

FULL SIX MONTH WARRANTY

on all Telesource component parts. Plus complete systems configured to your specifications.

FINEST QUALITY PRODUCTS

All SL-1 and ROLM models. Fully reconditioned and tested. New products also available.

NEXT DAY SHIPMENT

of all materials from our complete inventory—when time is of the essence.

QUALITY SHIPPING AND PACKAGING MATERIALS

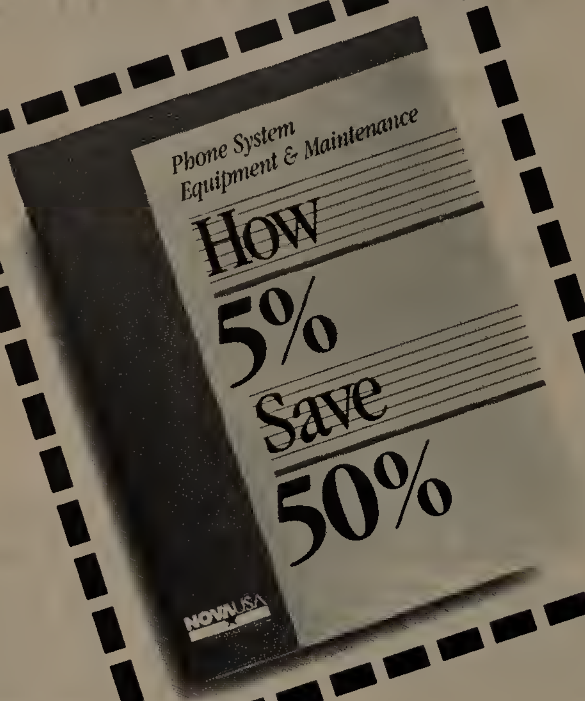
to insure that our products are delivered to you in perfect condition.

OUTSTANDING CUSTOMER SERVICE

Join the hundreds of SL-1 and ROLM users already receiving professional service, prompt delivery and outstanding value...

ONLY FROM
Telesource
(313) 335-3000
1450 HIGHWOOD EAST BLVD. • PONTIAC, MI • 48055

PSSSSSSSSSSSSSSST! ROLM® SYSTEM USERS:



For several years now, a small core of smart companies have been keeping their Rolm CBX systems up and running. Smoothly. Reliably. And for a lot less than you've probably been paying. What's their secret? Send for this FREE booklet and find out!

HOW 5% SAVE 50% maps out the strategies organizations like Texaco, Citibank, Memorial Hospital, and the University of North Carolina are using to snare big savings. It's packed with practical information you can use right away to realize big costs savings on your own Rolm system — from maintenance and expansions to profitable resale of excess equipment.

Send for your FREE copy today!
Call 1-800-288-0800. In Virginia, (703) 255-9696. Or mail this coupon . . .

☐ Please send my free copy of *How 5% Save 50%* so I can learn how to get quality service, reliability, and maximum savings on my phone system equipment and maintenance. This free booklet is mine without obligation.

Name ______________________________

Title ______________________________

Company ______________________________

Address ______________________________

City ______________________ State _____ Zip ______

Telephone (   ) ______________________ Ext. ______

Call 1-800-288-0800. In Virginia, (703) 255-9696.
Or mail this coupon to: **NOVAUSA** A TELECOMMUNICATIONS COMPANY
1639 Montmorency Drive
Vienna, Virginia 22180

Find out how you can join the Rolm system users who cut up to 50% off expenses . . . without sacrificing service or reliability!

NOVAUSA
A TELECOMMUNICATIONS COMPANY
Formerly TELE-LEASE CORPORATION

BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD
BCD

BUSINESS COMMUNICATIONS DISTRIBUTORS, INC.

Buy • Sell • Lease
Quantity Discounts Available

AUTHORIZED DEALER
AT&T PC6300 & 6300+; 3B2 & 3B5 Computers;
Merlin, Merlin Plus & Spirit Systems;
AT&T Facsimile

Secondary Marketers of Complete Systems, Upgrade Equipment and Replacement Parts for:

Systems 25, 75 & 85
Dimension • Horizon
Merlin & Merlin Plus
1A2 Key • W.E. Sets
Modems
(Data Phone II, etc.)

Authorized Dealer Also Stocking
Bogen Paging Equipment, Mitel PBX's, Southwestern Bell Telephones

(205) 661-9709
Mobile, AL Atlanta, GA New Orleans, LA Jackson, MS

NATD
National Association of Telecommunications Dealers
Charter Member

System Names are Registered Trademarks of AT&T

K-PLAN TEL, INC.

AUTHORIZED NATIONAL PARTS DIST.
NEC AMERICA, INC.
BUSINESS SYSTEMS SALES DIVISION

- **SALES**
- **REPAIRS**
- **PURCHASING**
- **PARTS**
- **DOCUMENTATION**

K
E
Y
NEC
P
B
X

2400
NEAX 12
NEAX 22
ELECTRA 16/48
ELECTRA 616
ELECTRA 100
ELECTRA 28
PATRICIAN 411
PATRICIAN COMMUNICATOR

—Price Quotes—Technical Assistance
FOR FURTHER INFORMATION
PLEASE CALL US:

(516)242-0111
3G SAXWOOD ST., DEER PARK, NY 11729

NETWORKING SERVICES

Specialized Services Include:

- Data Communications
- Local Area Networking
- Micro Computer Support
- Maintenance Of Computer Terminals
- Installation
- Consulting

Please Call...
(718) 257-4558

Your ad for
Bids and Proposals
Business Opportunities
Communications Marketplace
Consulting Services
Real Estate
Publications
Seminars and Conferences
Can be here for $119.00
Contact: Joan Pinsky
1-800-343-6474
(or in MA 617-879-0700) x297

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

Qualification Form for Free Subscriptions.

Please answer **ALL QUESTIONS,** sign and date the card.

Free subscriptions will be accepted only from individuals in the U.S. and Canada with active professional or managerial responsibilities in communications. The publisher reserves the right to limit the number of free subscriptions accepted in any business category. To qualify, you must answer all the questions below completely, **sign and date this form.**

If address has changed, attach mailing label with old address here.

☐ Address Change ☐ New subscription

First Name | Middle Initial | Last Name
Your Title
Company Name
Div. Dept.
Street Address
City | State | Zip Code

Is the above your home address? ☐ Yes ☐ No

I wish to receive a subscription to *Network World*: ☐ **Yes** ☐ No

Signature ______________________________

Title ______________________________ Date ______________

Business Phone (__________) ______________________

PLEASE ANSWER ALL QUESTIONS, SIGN AND DATE THE CARD.

1 My primary areas of activity. (Circle ONE only)
I am involved in evaluating communications (data, voice and/or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) ______________________

1a For communications, my primary responsibility is: (Circle ONE only)
1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) ______________________

2 Circle only the ONE title classification which most applies to you.

Company Management
- 11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications
- 21. Management
  VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
- 22. Supervisory/Staff:
  Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications
- 31. Management
  VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
- 32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications
- 41. Management
- 42. Supervisory/Staff

MIS/Data Processing
- 51. Management
  VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
- 52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others
- 75. Consultant
- 80. Educator
- 85. Financial Analyst
- 90. Marketing/Sales
- 95. Other ______________________

3 Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate
1. Business Management, Planning and/or Development

Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other ______________________

4 Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants
- 11. DP/Communications Consulting Services
- 12. Consulting Services (except DP/ Communications)

End Users
- 13. Manufacturer (other than computer/communications)
- 22. Finance/Banking/Insurance/Real Estate
- 23. Education
- 24. Medicine/Law
- 25. Wholesale/Retail Trade
- 26. Public Utility/Transportation
- 27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
- 28. Business Services (excluding DP/Communications)
- 29. Government: Federal
- 30. Government: State/Local

Vendors
- 41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
- 42. Interconnect
- 43. Manufacturer Computer/Communications Equipment
- 44. Value Added Reseller (VAR), Systems House, Systems Integrator
- 45. Distributor
- 46. DP/Communications Services (excluding consulting)
- 95. Other ______________________

5 In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

	A	B	Product/Services
			Computers
01.	☐	☐	Micros
02.	☐	☐	Minis
03.	☐	☐	Mainframes
34.	☐	☐	Printers
			Data Communications
04.	☐	☐	Communications Processors
05.	☐	☐	Comm./Networks Software
06.	☐	☐	Digital Switching Equipment
07.	☐	☐	Facsimile
08.	☐	☐	Modems
09.	☐	☐	Multiplexers
10.	☐	☐	Protocol Converters
11.	☐	☐	Network Mgmt. & Control
12.	☐	☐	Test Equipment
13.	☐	☐	3270 Controllers
35.	☐	☐	Intelligent Terminals
			Telecommunications
14.	☐	☐	PBXs
15.	☐	☐	Key Systems
16.	☐	☐	Central Office Equipment
17.	☐	☐	Integrated Voice/Data Terminals

	A	B	Product/Services
			Transmission/Network Services Equipment
18.	☐	☐	Microwave
19.	☐	☐	Satellite Earth Stations
20.	☐	☐	Local Area Networks
21.	☐	☐	Wide Area Networks
22.	☐	☐	Packet Switching Equipment
23.	☐	☐	Fiber Optic Equipment
36.	☐	☐	T1
			Communications Services
24.	☐	☐	Packet Switching Services
25.	☐	☐	Cellular Mobile Radio Services
26.	☐	☐	Electronic Mail
27.	☐	☐	Enhanced Services
28.	☐	☐	Centrex
29.	☐	☐	Long Haul Services
30.	☐	☐	BOC Services
31.	☐	☐	Independent Telco Services
			Other
32.	☐	☐	Factory Communications
33.	☐	☐	Online Data Bases

7 Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last 12 months?* (Check only ONE in column A.)
B. which you plan to specify,recommend or approve in *next 12 months?* (Check only ONE in column B.)

	A	B	
1.	☐	☐	$10 million and over
2.	☐	☐	$5 million - $9.9 million
3.	☐	☐	$1 million - $4.9 million
4.	☐	☐	$500,000 - $999,999
5.	☐	☐	$250,000 - $499,999
6.	☐	☐	$100,000 - $249,999
7.	☐	☐	$50,000 - $99,999
8.	☐	☐	Under $50,000
9.	☐	☐	Don't Know

8 Estimated gross annual revenues for your entire company/institution:
(Circle ONE only)
1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9 Estimated number of total employees at this location:
(Circle ONE only)
1. Over 5,000
2. 1,000 - 4,999
3. 500 - 999
4. 250 - 499
5. 100 - 249
6. 50 - 99
7. 20 - 49
8. 1 - 19

3A06-86

PLACE
POSTAGE
STAMP
HERE

NETWORK WORLD
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

P.O. BOX 1021
SOUTHEASTERN, PA 19398-9979

▲
FOLD HERE AND MAIL TODAY

STOP. Did you do the following:

1. Supply old and new address if address has changed
2. Answer all questions
3. Sign and date form

Enclosed is my:
☐ Address change.
☐ New subscription request.

THANK YOU.

NETWORK WORLD
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

PLEASE TAPE HERE
▲

EMPLOYMENT TODAY

Software Engineers

Interstate Electronics in Anaheim, California, has built a reputation for leadership by providing the U.S. Government with sophisticated solutions to national security requirements in the areas of signal detection and processing. Through superior system design, integration, test and evaluation, we have become the recognized leader in the detection, processing and analysis of very-low-level signals. You can be part of our exciting future. Consider the following opportunities:

Sr. Software Engineer

You will develop software support tools that are compatible with a VAX/VMS environment and portable to other host environments. These tools include assembler, linker, loader, simulator, debugger, builder and compiler. Requires a BS in Computer Science and experience in assembler/simulator development for microprocessor systems in a host/target environment. VAX/VMS experience highly desirable. **Dept. JH.**

Scientific Programming Analyst

You will be responsible for programming navigation software using Kalman filtering and maximum likelihood estimation techniques. Requires a B.S. in Mathematics, Statistics or related field. MS preferred. 5+ years experience in scientific programming using Fortran in a mainframe IBM environment and knowledge of multivariate regression analysis/techniques is essential. A background in Kalman filtering and maximum likelihood estimation is highly desirable. **Dept. JH.**

Software Engineer/Plasma Display

You will program microprocessors (8088, 8086, 68000, 68020) and IBM compatible PCs. A BSEE/BSCS is preferred. Must have written firmware for device drivers. Experience with firmware programming and knowledge of microprocessor system design desirable. **Dept. JW.**

For immediate consideration, please send your resume, salary history must be included, **(indicating Dept. for position(s) applying for)** to: **Personnel Dept., Interstate Electronics Corporation, 708 East Vermont Ave., Anaheim, CA 92803.** Equal Opportunity Employer. U.S. Citizenship Required. Principals Only, Please.

INTERSTATE
ELECTRONICS
CORPORATION
A Figgie International Company

Data Communications Marketing

PEOPLE & PRODUCTS
Designed to work together

For over fifteen years, General DataComm has been a pioneer and recognized leader in data transmission products and systems. Our comprehensive systems approach to product design ensures that each piece of equipment-from modems to multiplexers, from concentrators to central-site network management systems-is compatible with what's gone before and what's yet to come. Which is why we're recognized in the marketplace as the one company that offers a complete product line that fits together-and works together.

MARKETING MANAGER

You're a high energy marketing professional with a Bachelors degree (MBA preferred), 8-10 years promotional marketing or sales background and strong management skills. You're experienced with new product definition and introduction, and existing product enhancement. You're organized and detail-oriented and know the ropes when it comes to total preparation of product launch/announcement. You have in-depth marketing, media and research skills and have the ability to generate and develop marketing programs, sales strategies, product introduction packages and application selling. If this sounds like you–we'd be interested in talking to you.

In return for your top-notch qualifications, you'll enjoy personal satisfaction, professional opportunity and challenge, and an excellent salary and comprehensive benefits program offering a choice of health care programs, dental and vision care, 100% tuition reimbursement, profit sharing, 401(K) Retirement Savings Plan, stock purchase plan and other benefits. Our corporate headquarters is situated in beautiful New England surroundings, and is in close proximity to New York City, Boston, the Berkshire mountains and the ocean.

If you have the background we're looking for, please call Mr. Drew S. Arnold, Manager, Corporate Staffing at (203) 574-1118 Ext. 6913 or send your resume including salary requirements to his attention at:

General DataComm, Inc.
Corporate Headquarters
Middlebury, CT 06762-1299

General DataComm

An Equal Opportunity Employer M/F/H/V

GAI

has immediate openings for system and application programmer analysts with 3 plus years in any of the following:

Honeywell: GCOS 3 , GCOS 8, MULTICS, COMMUNICATION and DMIV-TP internals; PL6 and COBOL.

IBM 3081, 4341, S/36: MVS/XA, VTAM, CICS; VM, FOCUS; COBOL and RPG II.

WANG VS 150 and 65.

Opportunities currently exist in AZ, CA, TX, VA and HI. Excellent salary and benefit package. Send resume in confidence to:

Dick Spayd, GAI, 2501 W. Dunlap Ave., Suite 185, Pheonix, AZ 85021

or

Don Charney, GAI, 520 N. Washington St., Suite 300, Falls Church, VA 22046

TECHNICAL SUPPORT SUPERVISOR
Management Information Supervisor 6
State of Wisconsin

Wisconsin Department of Natural Resources (DNR), Bureau of Information Management, Madison. Starting salary between $33,876 and $41,244 or more annually depending on qualifications. The DNR is purchasing a new computer network which may be IBM, Data General, Digital Equipment Corp. (DEC), or a combination of vendors. Manage the Technical Support Unit in planning, implemention and monitoring the DNR's Computer Center and network to include supervision of the Software Services, Hardware/Network Support, and Systems Management. Contact Jackie Layman (608) 266-9236, Wisconsin Dept. of Natural Resources, PO Box 7921, Madison, WI 53707 for Special Application and Examination materials. Applications will be accepted until the needs of the service are met.

An Equal Opportunity Employer functioning under and Affirmative Action Plan

---

DATA CENTER MANAGER

Manager needed for financial institution data center in east Texas. Convenience of a small community, but with access to Houston and Dallas. Nine member staff using modified Florida Software on a Burroughs 4955 to provide on-line service to 15 offices statewide. Also supports two ATM's and several IBM PC's. COBOL programming experience a necessity. Resumes to:

Home Savings and Loan
Attn: Personnel
5036 Champions
Lufkin, TX 75901

RAMIS

Relational Software Solutions Incorporated, a growing team of highly skilled professional 4GL Application Development Consultants, provides personal growth and exciting assignments to individuals with significant RAMIS application development experience. These full-time positions offer you comprehensive paid medical, life & LTD benefits with outstanding salaries and liberal expense policies.

Our clients recognize our in-depth RAMIS knowledge and our ability to build very effective and efficient applications on-time and within budget. If you want to work on increasingly challenging assignments, and have RAMIS skills, with SBX, DMF, and the RAMIS/PC Workstation a plus, and want to join us in meeting the requirements of our expanding client base, please send your resume to, or call:

Loren Hurwitz or Rob Fcasni

at

Relational Software Solutions, Inc.
842 State Road
Pnnceton, NJ 08540
(609) 683-8655

SOFTWARE PROFESSIONALS

PROVEN PERFORMERS.

PANSOPHIC,

TELON™ . . .

& YOU

PANSOPHIC SYSTEMS, INCORPORATED ranks as one of the world's premier companies in the highly competitive computer software marketplace. Since 1969 Pansophic has been supplying software solutions to meet the needs of commerce, industry, academia and government. Over the last five years, Pansophic's revenue's have grown more than 300%, and beyond 31% last fiscal year alone. Our product portfolio includes graphics products, applications, software and application development products.

One of Pansophic's most exciting product families is TELON. A high-level design tool and application generator, TELON has grown to be the market leader for this type of mainframe product. TELON offers productivity gains—anywhere from 200% to 700%—that far exceed other application generation products. Tremendous growth in TELON product development activity has created dynamic opportunities at our Quincy, Massachusetts facility. We're seeking software professionals with ingenuity, creativity and drive.

DEVELOPMENT MANAGER

Responsibilities will include planning, scheduling and monitoring development projects; supervision of development staff; budgets; and coordinating with other managers on common projects. Requires advanced experience in data processing and demonstrated management skills. Degree preferred.

SOFTWARE SPECIALISTS

Several positions are available, ranging in responsibility from the junior to the senior/supervisory levels. Responsibilities include designing, coding, testing and documenting changes for new TELON development projects. Requirements include:

- Development experience—entry level to advanced
- College degree preferred
- Systems programming experience desirable

- MVS
- IMS
- PL-1
- CMS
- DOS/VSE
- CICS
- TSO
- COBOL
- PASCAL
- ASSEMBLER

EDUCATION SPECIALIST

Responsibilities will include conducting specialized TELON training courses to data processing professionals at our customer sites and at our TELON training center located in Quincy. Travel required. Two plus years in application programming with on-line experience (CICS or IMS/DC) are required. Previous experience conducting training and a degree are preferred.

Bring your own proven talents to PANSOPHIC. We offer you a competitive salary, excellent benefits that include profit sharing, and outstanding career development potential. For confidential consideration, send resume to S. Worthy, Dept. CW, Pansophic Systems, Incorporated, One Heritage Drive, Quincy, MA 02171. An equal opportunity employer m/f/h. (Principals only please.)

PANSOPHIC

BIOMEDICAL ANALYST PROGRAMMER

CEDARS SINAI, a major research, teaching, and acute care hospital has an opening for an experienced Analyst/Programmer to participate in the development of FORTH software for DEC computers in the Pulmonary Division. Applications include multi-user FORTH operating system development, database management, networking, device interfacing, real-time physiological data acquisition, billing, and financial analysis.

This position requires proven work experience in application and systems software development in assembly language and higher level languages with a strong preference for FORTH. Essential requirements include: understanding electronic hardware at the operation system level; experience with digital electronic interfacing, troubleshooting and modification; and training in the biomedical sciences.

Qualified applicants must have excellent verbal and written communications skills, be aggressive problem solvers, and be able to take responsibility for a software system supporting dozens of users in running a major medical service. An M.S. in B.M.E. or E.E. is preferred. For immediate consideration please send your resume to:

Ursula Allseits Bloor
Cedars-Sinai Medical Center
8723 Alden Drive
Los Angeles, CA 90048

Pick Systems Manager

M.D. IPA Health Plan has an opening in its MIS function for a senior systems professional for their PICK operating system.

Minimum requirements for the job are: 5 years total computer experience, 3 years experience with Pick operating system, bachelor's degree or equivalent MIS experience.

We are looking for someone to interface with our user community and develop application programs to meet their needs. We will be making major changes in our software in the next year. The successful applicant must be able to become productive in an HMO environment quickly. Supervisory experience preferred. Experience with Comtec application software would be helpful.

Competitive salaries and excellent benefits. Qualified applicants please send resume and salary requirements to:

M.D. IPA
The Quality Care Health Plan

451 Hungerford Drive, Suite 700
Rockville, Maryland 20850
Attn: Personnel/C.S.
E.O.E.

'PICK' PROGRAMMER/ANALYST

For PHN, Inc., a Baltimore based healthcare corp. with PPO, HMO and TPA subsidiaries. Excellent benefit package. Responsibilities: system design, program development and maintenance of in-house healthcare system. Requirements: 3+ years BASIC programming in relational DPMS environment, 'PICK' experience. Honeywell, DPS 6 and insurance background a plus. Non-smoking company. Send resume and salary history by 10/9/87 to:

Preferred Health Network, Inc.
5700 Executive Drive
Suite 104
Baltimore, MD 21228-1798
Attn: Beverly Kram
EOE

Where Challenge creates Opportunity

We are a leading provider of systems and services to the legal profession. Due to expansion we have several positions available in the following areas:

C APPLICATIONS PROGRAMMER

- Minimum 2 years experience in C language
- Knowledge of VAX VMS and relational databases (preferably Ingres) required.
- A/P and/or G/L or accounting applications experience extremely helpful
- Some design skills a plus

DIBOL APPLICATIONS PROGRAMMER

- Minimum 2 years DIBOL or COBOL + experience required
- Knowledge of VAX VMS operations system
- 2 years experience in business/accounting applications necessary (A/P and G/L preferred)

SYSTEMS PROGRAMMER/ TECHNICAL SUPPORT SPECIALIST

- Extensive (2-3 years) VAX VMS experience supporting installed client base
- Knowledge of C programming language and relational databases a plus
- Excellent verbal/written technical communication skills

NOTE: BS in Computer Science preferred for above positions.

QUALITY ASSURANCE SPECIALIST

Entry level position to develop, perform and analyze tests for accounting software packages requiring:

- BS/BA in Computer Science or Accounting (minor in Computer Science) or equivalent work experience in standard accounting practices
- Knowledge of VAX VMS, Ingres, DBMS, and/or quality assurance/testing procedures helpful
- Strong analytical/problem-solving abilities

We offer the right candidates a competitive salary and benefits package with the opportunity for significant career growth. Please forward resume, which must include salary history, to Carol Giardine:

QUORUM SYSTEMS
a Control Data Company

5165 Campus Drive
Plymouth Meeting, PA 19462
Equal Opportunity Employer m/f

NETWORK SYSTEMS PROGRAMMER

This position is a technical position in support of the campus wide networks of Princeton University. Candidates should have a working knowledge of computer communications including protocols (TCP/IP, SNA, BSC), hardware (ethernet, RS232, 37XX), and systems (VM/370, UNIX, MVS). The position offers an opportunity to develop solutions to network and system interconnections. The responsibilities of the position include evaluation of products, problem determination for existing networks, and implementation of solutions to problems in the network area.. The position will also offer an opportunity for work in the systems area. Candidates should have a working knowledge of assembler language and an interest in networks and systems at both the mainframe and micro level.

Send resume to: BRUCE FINNIE, COMPUTING & INFORMATION TECHNOLOGY, 87 PROSPECT ST., PRINCETON UNIVERSITY, PRINCETON, N.J. 08544.

Princeton University
PRINCETON, NEW JERSEY 08544
An Equal Opportunity/Affirmative Action Employer

◆ UNIX

Senior Systems Analyst

A prominent NYSE leader in the chemical coatings industry has an immediate opening for a professional with at least five years of UNIX, C and Oracle or Unify Database experience. This is a Research Center environment with 400+ users utilizing a Gould Powernode '9005 Computer with Berkeley 4.3 operating system. Because we have a small but diverse staff, this person will have an opportunity to work on a large variety of creative projects that will significantly enhance one's base of knowledge and experience.

We are located in a convenient, Northwest suburb of Chicago and offer a competitive salary and liberal benefits program including tuition reimbursement. Send resume with salary history and requirements in confidence to:

CW-B4964, Computerworld, Box 9171
Framingham, MA 01701-9171
equal opportunity employer m/f/h/v
Only those under serious consideration will receive replies

DP TRAINER/ USER CONSULTANT

Info Center Environment, Chicago, IL

Familiar with mainframe and/or micro software in an IBM environment. Must develop and deliver courses for DP staff and End Users and provide support as needed. Good people skills and programming background desirable.

Send resume to:

Frank Volante
The Peoples Gas Light and Coke Co.
122 So Michigan Avenue
Chicago, IL 60603

CMA

Special CMA Show Issue - October 19th

Closes: October 9th

Bonus Shows & Hotel Distribution

Call for further information on advertising in these Special Issues.

NETWORK WORLD

Contact: Classified Advertising,
375 Cochituate Road, P.O. Box 9171,
Framingham, MA 01701-9171
1-800-343-6474
(In Mass) **617-879-0700**

Position Yourself for Growth at System One

San Francisco area

System One Travel Resources, a subsidiary of Texas Air Corporation (which includes Continental and Eastern Airlines), the largest airline holding company in the free world, produces accounting and management information systems for travel agencies. Our rapid growth has created the following career opportunities at our beautiful San Francisco bay area location.

Senior Director Applications Programming

As a key member of the executive team, you will be responsible for the strategic direction and development of integrated vertical industry products on IBM hardware, from PCs to S/36 and S/38. You will also direct the day-to-day applications development, maintenance and quality assurance functions. The successful candidate will possess 10+ years' programming/data processing experience, including 5 years' recent systems development experience in an IBM System/38 and System/36 environment. Five plus years of managerial experience, excellent interpersonal communication skills, along with thorough knowledge of IBM System 38/RPG III programming and design, are also required. A Bachelor's degree is preferred.

Programmers
IBM S/36 or S/38

These positions require a minimum of 2 years' RPG II or RPG III programming and operations experience and excellent analysis and communication skills.

System One offers a competitive salary and comprehensive benefits package that includes worldwide airline travel privileges. Please forward your resume with salary history, indicating position of interest, to: **Manager of Human Resources, System One Travel Resources, Inc., 1100 Larkspur Landing Circle #175, Larkspur, CA 94939.**

(No agencies or phone calls, please)

System One

An Equal Opportunity Employer

Lead Programmer/ Analyst

At Ethan Allen we're in the process of developing a nationwide telecommunications network, with new systems and software to ensure our continued leadership position in the home furnishings industry.

To help us with this tremendous, long-term effort, we're scouting for an adept Lead Programmer/Analyst with 6+ years' experience in an IBM data communications mainframe environment using CICS. Bachelor's degree, proven communication skills and the ability to master advanced computer technology to solve business needs are also required.

Located at our international corporate headquarters in Danbury, the selected candidate will enjoy an excellent salary and benefits package, in an attractive and progressive environment. If you possess the qualifications—and the energy to put such an extensive plan into action—we'd like to hear from you. Send your resume with salary history/requirements to: Personnel Department-CW, Ethan Allen, Inc., Ethan Allen Drive, Danbury, CT 06811. An Affirmative Action Equal Opportunity Employer M/F.

Ethan Allen inc.

We furnish great careers.

OVERSEAS & LOCAL POSITIONS for COMPUTER PROFESSIONALS with TS EBI/SBI

LOGICON's Operating Systems Division - a recognized center of excellence for design and development of advanced C3I systems is seeking experienced computer professionals to join its multi-talented technical staff in its Northern Virginia and European facilities.

Successful applicants will have from 4 to 20+ years of hands-on experience in IBM mainframe or DEC VAX environments and superior skills in at least two of the following:

Systems Engineering
Systems Integration
Systems Programming -VM/SP
C3I Requirements Analysis & Engineering
Software Architecture
Software IV&V/QA/CM
Software Development - IBM ALC, M204 or UNIX/C
Multi-Level Computer Security
Secure Communications
DODIIS or DDN Networking
Automated Message Handling

In addition to a very competitive salary structure, LOGICON offers a generous benefits package that includes profit sharing, stock purchase and 401 (k) plans as well as company-paid medical, dental, disability and life insurance.

Overseas assignments provide liberal relocation and housing allowances, premium pay and substantial tax benefits.

For more information call Nancy Gandee at (703) 591-2450 or send resume to: Logicon, Inc., 10398 Democracy Lane, Fairfax, VA 22030.

LOGICON

Operating Systems

EOE/AA/M/F/H/V

OVERSEAS JOBS!

TAX FREE INCOME

Our clients are hiring NOW for:

PROGRAMMERS/ANALYSTS
- IMS/CICS/ADABAS/IDMS
- RPG II, III/ORACLE/PCS

SYSTEMS PROGRAMMERS
- PRIMOS/VMS/AOS/MVS

SOFTWARE ENGINEERS
- CADCAM/UNIX-C

TECHNICIANS
- IBM MF/HP/DEC-VAX

MANY OTHER FIELDS

Sunday 9:00-3:00
Weekdays 8:30-5:30

(213) 382-9999

OVERSEAS CAREERS
OF CALIFORNIA AGENCY

3701 Wilshire Blvd.
Dept. 222CW
Los Angeles, CA 90010

Advance fee required-refundable.
100% GUARANTEE AVAILABLE
Licensed and bonded
as an employment agency.

GUARANTEED RESULTS!!

SYSTEMS ANALYST

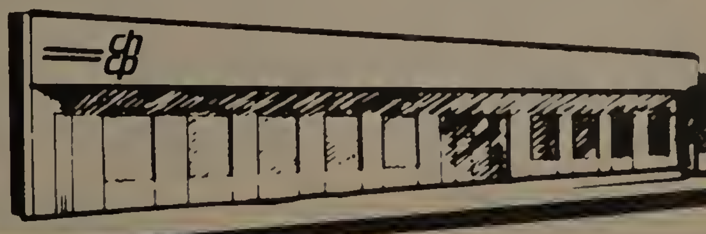
A growing, multi-site health care deliverer is searching for a project leader to be a key participant in developing sophisticated information systems in an on-line real time environment using HEWLETT-PACKARD Hardware. In addition to competitive salary and excellent benefits, we offer career growth with a premiere HMO. You must have the following qualifications: heavy systems analysis and design experience with sophisticated on-line systems for large corporation; strong project discipline, knowledge of COBOL. Health care insurance application desirable. Send resume and salary requirements to:

Daniel Lenhart, Recruiter
CHCP
221 Whitney Avenue, New Haven, CT 06511

We are an equal opportunity employer M/F

Community Health Care Plan

Affiliated with Blue Cross & Blue Shield of Connecticut



SOFTWARE APPLICATIONS DEVELOPMENT

SCIENTIFIC AND RESEARCH INFORMATION SYSTEMS

As a world-renowned force in pharmaceutical research and development, Hoffmann-La Roche can offer exceptional career opportunities to talented Systems professionals.

We are in the process of re-designing pre-clinical and clinical systems on multi-clustered VAX computers.

PRE-CLINICAL

You will design and implement biological, chemical and literature text retrieval data base systems, as well as manage the interface of scientific instruments with computer networks.

CLINICAL

You will design and implement systems for clinical trials and adverse reaction data bases.

You must have a relevant degree, along with experience in data base applications using 4th generation languages (such as ORACLE, NOMAD2, SQL) and FORTRAN, C or PL1; familiarity with MDL products (MACCS or REACCS), the ability to conduct program testing, and strong communication skills are essential.

In return, you'll receive a comprehensive compensation package, and the opportunity to work on a team of professionals. For consideration, please send your resume, indicating salary history and requirements, to: **Diane Briggs, Hoffmann-La Roche Inc., Nutley, New Jersey 07110.** We are an equal opportunity employer.

ROCHE **Hoffmann-La Roche**

Working Today For A Healthier Tomorrow.

PROGRAMMER/ANALYSTS (Experienced)

VICTORIA'S SECRET STORES, the fastest growing division of the Columbus, Ohio based LIMITED, INC., is adding several positions for experienced Programmer/Analysts. If you are looking for a progressive, fast-paced work environment, we have the opportunity for you!

We seek individuals with 2 or more years of programming experience with application design skills. Our environment is:

- **IBM 3090**
- **COBOL Batch/Online**
- **IDMS Database Management Systems**
- **CICS**
- **TSO/SPF**

Previous retail experience in Merchandising systems is a plus and a college degree is required. Additionally, Systems 38 applications development experience is helpful.

Victoria's Secret Stores is the leading intimate apparel retailer in the nation with 210 stores across the country. We will double in size over the next 2 years providing tremendous opportunities for career growth for our associates! If you would like to become a part of our MIS team, please send resume to: **VICTORIA'S SECRET STORES, Personnel Department–TLB, P.O. Box 16586, Columbus, Ohio 43216.** NO PHONE CALLS, PLEASE.

VICTORIA'S SECRET STORES

An Equal Opportunity Employer

COMMUNICATIONS SYSTEMS PROGRAMMER

A new position has been created recognizing Wheel Horse Products' expanding telecommunication needs. The successful candidate will develop improvements in telecommunications to areas within and outside the company, install and maintain communication systems, and train others in the use of these systems. To qualify for this position, candidates must possess a B.S. in Computer Science or Business with experience in DOS/CICS systems programming, SNA/SDLC communication networks, and PC-to-PC and PC to mainframe communications. DOS/VSE and VM systems programming and E-Mail/BBS experience is desirable. Current system is 4381 and 4Phase minicomputers. We offer a highly competitive salary and excellent employee benefits. For confidential interview, send resume and salary requirements to:

WHEEL HORSE PRODUCTS, INC.
Attn: Salaried Personnel
515 West Ireland Rd.
South Bend, IN 46614
Equal Opportunity Employer

ANALYST PROGRAMMERS DATABASE ANALYST

Major corporation relocating operations to a highly desirable eastern PA location. Positions exist for individuals to work on large projects as part of a dynamic project team and to handle smaller projects independently. Current systems are on-line applications utilizing IBM hardware. 4 year degree (Business or Computer Science) preferred, but will consider experience in COBOL and/or PL/1 with knowledge of OS or MVS JCL. Other areas of experience desirable for some positions would be in manufacturing, with an ADABAS or NATURAL background; knowledge of CYBORG payroll or McCormack and Dodge fixed assets packages. Excellent compensation benefit package. List your resume in confidence on our national network. Please include salary and geographic preference.

J-Rand Personnel, Inc.
2 Bethlehem Plaza
Bethlehem, PA 18018

Racal-Milgo

Marketing Professionals

Data Communications

Racal-Milgo is an international supplier of data communications equipment. The company develops, manufactures, markets and supports digital, analog and fiber optic products, including network management systems, data encryption devices, modems and multiplexers.

Product Manager: We seek an individual with a BS in Marketing or equivalent experience, and 5 years of "hands-on" product marketing including 2 years within data communications (preferably multiplexer or modem products). Excellent communication skills are also required in this high level, high-visibility position. As Product Manager, you will be responsible for business plans to management, and the coordination of product development projects to include functional specifications, market requirements and regulatory mandates.

Product Specialist – International: Qualified candidates will have a BS degree in Marketing or equivalent experience (MBA preferred). You should possess a minimum of 2 years of professional marketing experience in data communications, computer systems, peripherals, or telecommunications. Exposure to international marketing preferred.

Our comprehensive compensation-benefits package includes medical/dental/life insurance, 3 weeks of paid vacation your first year, 401K savings plan and 100% paid tuition. Send your resume and recent salary history in confidence to: Keith Terrell, Sr. Employment Representative; **Racal-Milgo, Inc.;** P.O. Box 407044 (16337); Ft. Lauderdale, FL 33340-7044.

An EEO Affirmative Action Employer

RACAL
The Electronics Group

VAX COBOL PROGRAMMER/ANALYSTS

Join an MIS team which is on the leading edge of VAX Technology. Riley Stoker Corporation, a leader in the cogeneration and resource recovery industry, presently has 2 newly created openings for VAX COBOL Programmer/Analysts. Working in our Commercial Systems Department, the selected individuals will be responsible for assisting user management in the development and maintenance of financial project and sales support systems.

To qualify for these positions, candidates must possess a Bachelor's Degree in Marketing, Business Administration or a similar degree, 3-5 years of VAX COBOL programming experience, as well as proven analytical skills. Familiarity with Datatrieve and business support systems are preferred.

Call Michael R. Kelliher at (617) 852-7100, extension 478 or send a resume with salary requirements to: Employee Relations Department, Riley Stoker Corporation, P.O. Box 2040, Worcester, MA 01613-2040.

Riley Stoker is an Equal Opportunity Employer M/F.

RILEY STOKER
An Ashland Technology Company

WE'VE BEEN NETWORKING FOR YEARS!!!

SYSTEMS ENGINEER - Provide technical backup to headquarters and sealed personnel in application of products to solve customer data communication needs. 5 years experience. Must be familiar with modems, multiplexors, and fiber optics. Location west of Boston. From $40-$50K. Strong interpersonal skills required.

SECTION MANAGER - Management responsibilities for several products in the areas of modems, time division multiplexors, computer driven auto dialers and LAN's. BSEE or comparable degree required. To $65K. New England location.

ISDN MANAGER OF SYSTEMS DESIGN - Must be familiar with ISDN and SNA protocols. 8+ years experience with EE or Computer Science degree. Software oriented experience required. $60-$70K. New England locations.

SR. SOFTWARE PROJECT ENGINEER - UNIX and C background required. 5+ years experience. Appropriate degree. Salary: $45-$50K. New England locations.

Client companies assume all fees, confidentiality assured. For these and other nationwide opportunities, submit your resume to:

PETER ANSARA
C/O SELECTIVE PERSONNEL
P.O. BOX 239
1111 ELM STREET, SUITE 14
WEST SPRINGFIELD, MA 01090
OR CALL

413-733-0791 **FAX 413-733-2590**

COMPUTER & COMMUNICATIONS SYSTEMS SPECIALIST

Major international airline located in midtown Manhattan, NY is seeking professional to manage its microcomputer and data/voice communication systems in the U.S.A. Responsibilities will include: maintenance of existing network of real-time terminals; development of software for newly installed microcomputer/PC systems; user training; plan, design and implementation of system upgrades as well as their integration with the mainframe systems at Corporate Headquarters. The successful candidate will have a BS degree in Engineering, knowledge of data/voice communication systems and 2 or 3 years experience in developing software for interactive micro computer systems. An advanced degree in Computer Science is preferred. We offer a highly competitive salary and an excellent benefits package including medical, dental, life, pension and free travel. Send resume which must include salary history and salary requirements in confidence to: Box #CW-B4965, Computerworld, P.O. Box 9171, Framingham, MA 01701-9171.

SEMINARS & CONFERENCES

ADVANCED COMPUTER CLASSES

- Local Area Network Survey
- Novell Command Line Utilities
- Novell Network Supervisor
- Wide Area Network Survey
- Advanced DOS

Hands-on training
1 & 2 day classes

TRAINING INSTALLATION
MAINTENANCE

TEKSHOP, INC.
(205) 326-6211
2717 7th Ave. So.
Birmingham, AL 35233

SETA
Southeastern
Telecommunications Assn

12th Annual Conference

Nov 15-18

Marriotts Orlando
World Center
Orlando, FL

*Seminars *Exhibits
*Speakers

For more information call:
SETA Office **800-445-1476**

TRAINING

T1 & X.25 courses now available!

Transform your PC into a personal instructor with

TELEtutor™

TELECOMMUNICATIONS TRAINING SERIES

CALL FOR FREE BROCHURE

800-542-2242

Bank wields net weapons

continued from page 1

bank products while answering customer inquiries about changing existing accounts or starting new accounts.

Also, the network will cut down dramatically on the paperwork involved in opening new accounts by enabling customer service representatives to prepare necessary documents on a personal computer and print out finished copies.

Chemical Bank officials are hoping the network will give the bank a much-needed competitive boost. Shortly after its network plans were unveiled, the bank announced that problems with loans to third world nations would contribute to a $65 million third-quarter loss. The bank also announced a reorganization plan that will eliminate 2,100 jobs, roughly 10% of its work force.

Bank officials would not disclose how much the firm is investing in the network.

"By providing customer service representatives with more information about a customer's relationship with the bank, we think this network will significantly enhance our ability to sell additional banking services," said Cliff Potenza, vice-president for retail delivery systems at Chemical Bank and manager of the network project.

"Maintaining a competitive position requires an aggressive sales and service posture," he said. "We will continue to distinguish ourselves by servicing our customers efficiently. We believe this technology is the key to doing that."

The network will spare bank personnel the manual chores of looking up paper-based customer account files and completing the necessary paperwork.

"The way we envision it, this network will permit more of a sales dialogue with the customer, as opposed to an order-taking function, the way banks have historically opened accounts," Potenza said.

Chemical Bank will install a single Digital Equipment Corp. MicroVAX II, MicroVAX 2000 or VAX 8550 minicomputer in each of its more than 200 branch offices throughout the New York metropolitan area. Each branch will also be outfitted with a number of new IBM Personal Computer AT-compatibles to be supplied by an as-yet-unnamed vendor. The personal computers will be linked to the in-branch VAX via an Ethernet running DEC's DECnet software. The personal computers will be able to access VAX-resident applications as well as store files on the VAX.

The VAXes will be linked to a VAX Cluster at Chemical Bank's data center via point-to-point leased lines operating at 2,400 bit/sec and 9.6K bit/sec. A DECnet/SNA Gateway on the VAX Cluster will provide a link to existing Systems Network Architecture-based IBM 3090 and 4381 mainframes.

Although linked to VAXes, the personal computers will not be emulating DEC or IBM terminals. "What we think is the cutting edge here is some very unique software Chemical Bank developed to enable our PCs to always be PCs while talking to a VAX," Potenza said.

Chemical Bank developed a personal computer application that formats and routes requests for data from the personal computer to an in-branch VAX via DECnet. A VAX-resident application that Chemical Bank jointly developed with DEC determines where the requested data resides and sends messages to retrieve it. The applications are similar to IBM's Advanced Program-to-Program Communications software.

Ten Chemical Bank branch locations were linked to the data center earlier this year, and 16 others are expected to be networked by year end. The overall project is expected to be completed by 1988.

"With this application, the business people in the branch do not need to know where data is coming from or where it is going. Nor do they have to understand the technical means of getting data or putting something back somewhere," Potenza said.

"In most local network applications, there is almost a written requirement for a personal computer to emulate a terminal when talking to a minicomputer or mainframe. We never want to do that. We want to retain that rich PC functionality, like windowing and field-level editing capabilities that you can't get from an emulation process, while providing an interaction with minis and mainframes," Potenza said.

In addition to the branches, Chemical Bank's telemarketing center will be integrated into the network. Currently, the telemarketing department operates independently of in-branch customer service departments. Telemarketing representatives answer incoming inquiries and mail out forms required to open accounts or apply for loans. Customers must then fill out those forms and return them to one of Chemical Bank's branches.

With the new network, a telemarketing representative will be able to use a personal computer to access customer files and then complete any required forms on the personal computer. Those forms, some of which require the customer's signature, can be stored on the IBM mainframe.

The completed documents can then be accessed from personal computers at the branches. The customer service representative in the branch can then print out the documents and have them ready when the customer comes to the branch, Potenza said.

TCA blending voices

continued from page 1

Lockheed Aircraft Co., TCA has expanded throughout the Western U.S. Earlier this year, the group announced plans to become a nationwide organization.

"We cannot lose sight of the fact that we are a volunteer, chapter-oriented organization of users," TCA President Lionel Gillerman told *Network World*.

According to Gillerman, taking TCA national will increase its influence with vendors and regulatory bodies. Moreover, he said, new members will have the benefit of belonging to an organizaton that focuses on local and regional, as well as national concerns. Unlike its major counterpart, the International Communications Association (ICA), the focal point of TCA's activities are its chapter meetings.

"We feel we will have the best of both worlds," said Gillerman, who is manager of network technology at McDonnell Douglas Aerospace Information Services Co. in Cypress, Calif. "We will be able to act on local issues, and we will have the strength of a national organization."

Currently, TCA has more than 2,500 individual members from more than 1,000 member companies. The group comprises seven chapters in five states: Arizona, Colorado, Oregon, Washington and California, which has three chapters. All told, there are individual TCA members in 35 states and in the District of Columbia.

"We have members throughout the country," Gillerman said. "One of the reasons we want to change our structure is to allow those people to get the benefits of chapter membership, which they are not getting today." TCA members said they endorse the group's expansion plans. "TCA is a user-directed organization that puts forward user views, and I strongly endorse the plan to expand. There are other users out there who need to be represented," said William McDonald, telecommunications director at the Tri-City Medical Center in Oceanside, Calif.

Member companies can have multiple representatives in TCA, but each firm is permitted only one vote. Consultants and vendors are prohibited from joining. In 1985, the group established a vendor council made up of officials of vendor companies that serves as TCA's liaison to the vendor community. But vendor council members are not TCA members, TCA Chairman Prince Dyess said.

This year, Gillerman said, the group is drawing up plans to restructure its organizational framework and membership fee structure to accommodate expansion. Today the association is governed by a 24-member corporate board of directors that includes at least one member from each chapter. As it expands, the TCA is likely to institute a regional management component between the national ruling body and the chapters.

According to Dyess, director of telecommunications at the Scripps Clinic and Research Foundation in La Jolla, Calif., some smaller user organizations have expressed fears that TCA is interested in "taking them over." Dyess sought to allay that concern. "We are a volunteer organization with no interest in taking over anyone," Dyess said. He added that existing user organizations would not lose their independence by joining TCA.

"Our chapters essentially operate autonomously under relatively loose guidelines," Dyess said. "The chapters place individuals on our corporate board and corporate committees. So, if an organization joined TCA, they would not be giving up anything. They would be in the position of helping to lead TCA."

TCA's monthly chapter meetings are a key component of the group's activities, Dyess said. "So much peer interaction goes on at those monthly meetings," he said. "It is great to look around the room and see so many people with expertise in voice, data and radio, not just willing, but eager to share their knowledge."

In addition to monthly meetings, TCA conducts educational and training programs and represents the member companies' interests in legislative, legal and regulatory matters.

According to Rebel Kreklow, vice-president of the group's member services committee, TCA members are increasingly concerned about general management and business matters, in addition to the technical issues that have always been of interest to telecommunications professionals.

"There is a lot of interest in issues like ISDN, of course," Kreklow said. "But TCA members are interested in all aspects of running an information and communications organization — things like dealing with executive stress, long-range planning and using communications for strategic advantage."

TCA retains the Washington, D.C.-based law firm Wiley, Fielding & Rein to represent the group on legal and regulatory matters, according to Michael Woody, corporate vice-president of TCA's regulatory affairs committee. That committee consists of a member from each of the chapters as well as the chairman of the government liaison committee, William Moore, a regulatory specialist for Boeing Computer Services Co. in Seattle.

Woody said legal, legislative and regulatory matters are sometimes addressed at the local and regional level by individual chapters. The corporate committee takes up cases of interest to the membership as a whole. TCA recently lent its support to a coalition that defeated a proposed regulation in the state of Utah that would have required users to reveal extensive information about private telecommunications networks. "We do not have a chapter, but we do have members there, and the issue was one that is important to all users," Woody said.

TCA is currently active in efforts to defeat a proposed tax by the city of Los Angeles on long-distance calls.

Private nets vulnerable in plan

continued from page 1

hanced service providers, the FCC does not make that distinction.

"In theory, this proposed access charge order could apply to private network users as well as public enhanced service providers," said Ruth Milkman, the staff attorney in charge of the access charge issue for the FCC Common Carrier Bureau. "The FCC doesn't make the distinction between private and public carriers or even between a private packet network and a public one."

The access charge issue surfaced in June, when the FCC proposed eliminating a 1983 rule that exempted enhanced service providers from the access charges that long-haul carriers and service resellers pay local exchange carriers for use of local switched facilities. The exemption was granted because the FCC did not believe the information service industry was financially stable enough to sustain a major cost increase, Milkman said.

"We tentatively conclude that it is now appropriate that enhanced service providers be assessed access charges for their use of local exchange facilities. We want to develop a rate structure under which all exchange access users are charged on the same basis," the FCC proposal said.

But the language in the FCC's proposal is unclear on whether private corporate networks would be subject to access charges. According to Kenneth Phillips, chairman of the Committee of Corporate Telecommunications Users and vice-president of telecommunications policy at Citicorp, "Our interpretation of the FCC statement is that if a corporate network connects to the public switched network, it is subject to the same access charges that carriers pay."

Michael Senkowski, Washington, D.C. attorney for the Telecommunications Association (TCA) said he believes the pending proposal is limited to enhanced service providers. "It does not specifically propose extending access charges to private networks, but if the commission succeeds in extending access charges to enhanced service providers, the next step will be to extend them to other noncarriers — specifically users."

According to Michael Woody, vice-president of regulatory affairs for the TCA, "FCC Commissioner Mimi Weyforth Dawson said publicly that end users should have to pay access charges, just as carriers do. That makes the FCC's intent pretty clear." Dawson's office did not respond to a request for confirmation of this statement.

"Our objective is to allocate costs equally among all users of the public net," said FCC Common Carrier Bureau Chief Gerald Brock in a recent *Network World* interview. "We want to eliminate unnecessary discrimination and treat all users, vendors and services equally. Under the old system, people using identical services were paying vastly different rates."

Users question the FCC's legal authority to regulate private networks. "This is a constitutional issue," Phillips said. "The Communications Act of 1934 does not give the FCC authority over private networks." Furthermore, the FCC never informed users that this proposed ruling would affect them, which is a requirement under FCC rules, he said.

Joanne Hutcheson, network supervisor at E.I. DuPont de Nemours, Inc., said the company's attorneys are still studying the potential cost impact of the FCC's proposal. "We have a private-line voice network, several data networks, a private packet network that interconnects with public packet nets and a wide-area network," Hutcheson said. "We provide dial-up access to our private network users, which would seem to put us in the FCC's target group.

"If an employee wanted to access a corporate host from a PC at his home, he would have to use switched access," she said. "Under the FCC's proposal, we would have to pay the local carrier access charges. We haven't even begun to calculate what this ruling could cost us in increased telephone charges, although it's substantial."

DuPont estimates that its cost for public packet services alone could increase by as much as 50% if enhanced service providers have to pay access charges, Hutcheson said. DuPont now spends $100,000 a month for packet services supplied by Tymnet/McDonnell Douglas Network Systems Co., she said.

"If these access charges are imposed on information service providers, the industry will respond by seeking alternatives to local switched access, perhaps bypassing the local exchange. Users are going to respond by trying to reduce costs and cut back on usage," Hutcheson said.

Gerry Salemme, senior telecommunications policy analyst for the U.S. House of Representatives Telecommunications Subcommittee said, "It appears the FCC proposal is in conflict with the FCC's earlier stated policy objectives of promoting the development of the information services market, making affordable services available to a wide cross section of users and protecting ratepayers from excessive telephone rates."

Network World Sales Offices

BOSTON
Donna Pomponi, District Manager
375 Cochituate Rd., Box 9171
Framingham, MA 01701-9171
(617) 620-7709

NEW YORK
Paul Bonington, District Manager
Paramus Plaza 1, 140 Route, 17 North
Paramus, NJ 07652
(201) 967-1350

NEW JERSEY/PHILADELPHIA
Joan Daly, Eastern Regional Manager
Paramus Plaza 1, 140 Route, 17 North
Paramus, NJ 07652
(201) 967-1350

WASHINGTON, D.C.
Bill Burke, District Manager
2133 Defense Highway, Suite 205
Crofton, MD 21114
(301) 721-4765

SAN FRANCISCO
Chris Clyne, Western Regional Manager
3350 West Bayshore Rd., Suite 201
Palo Alto, CA 94303
(415) 328-4618

ATLANTA
Tom Tolbert, District Manager
1400 Lake Hearn Dr., Suite 330
Atlanta, GA 30319
(404) 394-7509

CHICAGO
Fran Jonikaltis, District Manager
10400 West Higgins Rd., Suite 300
Rosemont, IL 60018
(312) 297-8855

LOS ANGELES
David Pronenko, District Manager
18004 Sky Park Cir., Suite 100
Irvine, CA 92714
(714) 250-3006

CLASSIFIED ADVERTISING
Joan Bayon Pinsky, Account Executive
375 Cochituate Rd., Box 9171
Framingham, MA 01701-9171
(617) 620-7709

CW Publishing/Inc.

An IDG Communications Company
James S. Povec/**President**

Network World Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171, Phone: 617-879-0700, Telex: 95-1153, FAX: 617-875-8931

Ron Mastro
National Sales Director

Pam Valentinas
Manager/Marketing & Sales Operations

Karen Wallace
Account Coordinator

Production Director, Peter Holm, **Senior Production Manager,** Leigh Swearingen, **Production Coordinator,** Christopher P. Cuoco
Corporate Distribution Manager, Robert W. Wescott, **Circulation Manager,** Richard Priante

IDG Communications/Inc.

Patrick J. McGovern
Board Chairman

Axel Leblois
Chief Executive Officer

William R. Murphy
Vice President Finance

Network World is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S *Computerworld Argentina;* ASIA'S *Communications World, Computerworld Hong Kong, Computerworld Malaysia, Computerworld Singapore, Computerworld Southeast Asia, PC Review;* AUSTRALIA'S *Computerworld Australia, Communications World, Australian PC World, Australian Macworld;* AUSTRIA'S *Computerwelt Oesterreich;* BRAZIL'S *DataNews, PC Mundo, Micro Mundo;* CANADA'S *Computer Data;* CHILE'S *Informatica, Computacion Personal;* DENMARK'S *Computerworld Danmark, PC World Danmark;* FINLAND'S *Mikro, Tietoviikko;* FRANCE'S *Le Monde Informatique, Distributique, InfoPC, Telecoms International;* GREECE'S *Micro and Computer Age;* HUNGARY'S *Computerworld SZT, PC Mikrovilag;* INDIA'S *Dataquest;* ISRAEL'S *People & Computers Weekly, People & Computers Biweekly;* ITALY'S *Computerworld Italia;* JAPAN'S *Computerworld Japan;* MEXICO'S *Computerworld Mexico;* THE NETHERLANDS' *Computerworld Netherlands, PC World Benelux;* NEW ZEALAND'S *Computerworld New Zealand;* NORWAY'S *Computerworld Norge, PC World Norge;* PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld, China Computerworld Monthly;* SAUDI ARABIA'S *Arabian Computer News;* SOUTH KOREA'S *Computerworld Korea, PC World Korea;* SPAIN'S *CIMWORLD, Computerworld Espana, Commodore World, PC World Espana, Communicaciones World, Informatica Industrial;* SWEDEN'S *ComputerSweden, MikroDatorn, Svenska PC World;* SWITZERLAND'S Computerworld Schweiz; UNITED KINGDOM'S *Computer News, DEC Today, ICL Today, LOTUS, PC Business World;* UNITED STATES' *Amiga World, CD-ROM Review, CIO, Computer Currents, Computerworld, Computers In Science, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, InCider, Infoworld, Macintosh Today, Macworld, Computer + Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC World, Portable Computer Review, Publish!, PC Resource, Run, Windows;* VENEZUELA'S *Computerworld Venezuela;* WEST GERMANY'S *Computerwoche, Information Management, PC Welt, PCWoche, Run.*

CALENDAR

Oct. 5-6, San Francisco — The Fourth Annual Third-Party Maintenance Conference. Contact: Customer Service, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

Oct. 5-7, Bal Harbour, Fla. — Pay Phone Expo '87 East. Contact: TeleStrategies, Inc., 1355 Beverly Road, McLean, Va. 22101.

Oct. 8, Boston — Effective Project Management. Also, Jan. 25, Detroit; Jan. 29, Indianapolis. Contact: Business and Professional Research Institute, 1700 Post Road, Fairfield, Conn. 06430.

Oct. 12-15, Washington, D.C. — Telephone Technology and Practice. Contact: ABC TeleTraining, P.O. Box 537, Geneva, Ill. 60134.

Oct. 13-14, Dallas — VAX Users Show Exposition & Conference. Contact: The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

Oct. 14-15, Newport, R.I. — The Newport Conference on Fiber-Optic Markets. Contact: Newport Conference on Fiber-Optic Markets, KMI Corp., America's Cup Ave. at 31 Bridge St., Newport, R.I. 02840.

Oct. 14-16, Washington, D.C. — The Great International Celebration of Satellites in Space. Contact: Society of Satellite Professionals, P.O. Box 7154, McLean, Va. 22106.

Oct. 18-21, Phoenix — Systems Integration: The Business Challenge. Contact: Marcia Farrington, International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Oct. 19-20, Denver — Two Days to Successful Incoming Call Center Management. Also, Oct. 22-23, San Francisco; Oct. 27-28, Baltimore. Contact: Incoming Calls Management Institute, P.O. Box 6177, Annapolis, Md. 21401.

Oct. 19-21, New York — Systems Network Architecture: Architecture, Products and Current Implementations. Also, Oct. 22-23, New York; Nov. 16-18, San Francisco. Contact: Information Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481.

Oct. 26-28, New York — The VAX Business User Forum. Contact: Dorothy Ferriter, IDG Conference Management Group, P.O. Box 9171, Framingham, Mass. 01701.

Nov. 9-10, Bethesda, Md. — The Post-Divestiture Tariffs and Their Impact on Large Networks. Contact: The Aries Group, Inc., Suite 320, 1500 Research Blvd., Rockville, Md. 20850.

Nov. 18-19, Washington, D.C. — Electronic Organizations. Contact: International Center for Information Technologies, 2000 M St. N.W., Washington, D.C. 20036.

▶ *PRODUCT REVIEW*

Monitors make life easier

Call management systems keep telecom managers in the know.

BY JOHN J. HUNTER
Contributing Writer

If you manage a phone room such as those used in the mail-order business, you're in a no-win position. If you're understaffed during peak calling periods, your company runs the risk of losing money when potential customers get busy signals or grow tired of being on hold and hang up. Conversely, if you staff up to handle any call-volume contingency, the company loses money during slow periods.

What to do? Install a call management system that monitors telephone call traffic, points out peak periods and the number of agents needed to handle different call volumes, and identifies factors, such as agent efficiency, that adversely affect the quality of the call-answering service.

Two such products are the MIS-1 from Telecalc, Inc. and the RT-10 from Perimeter Technology, Inc. Both are personal computer-based software products that solve the most common phone-room problems and provide essentially similar services. They differ, however, in that the Perimeter offering works with both private branch exchanges and Centrex, while the Telecalc unit is for Centrex only. In addition, the Perimeter product does a better job of displaying data. According to one user, its graphics format lets managers see, at a glance, what's going on in the entire phone room.

Telecalc has been around since 1983. Its highly regarded MIS-1 has been marketed heavily to regional Bell holding companies such as Pacific Telesis Group and Bell Atlantic Corp., both of which reportedly are using the MIS-1 internally. Perimeter is a relative newcomer — founded in March 1987 — but its parent company, Callscan Ltd. of Birmingham, England, enjoys a good reputation abroad.

Real-time management

The MIS-1 and RT-10 provide primarily real-time status information for phone-room management. Both systems monitor levels of call activity, showing the status of trunks, calls in progress, calls waiting in queues, time before calls are answered, length of calls, calls lost due to hang ups and agent status. Managers using the systems receive information regarding agent performance, such as the number of calls handled, length of each call, percentage of time spent on the telephone, average time on hold and time spent waiting for calls. Information is also provided showing the performance of agent groups and departmental productivity.

Both systems compile these performance statistics into historical files that are used by the RT-10 and MIS-1 to calculate and forecast staffing schedules to meet specified performance levels. The Telecalc product even generates an economics report that determines the most profitable level of service needed to operate.

The RT-10 has no similar facility as such, but the vendor claims that by running the forecast and schedule data through its optimization program, a report is produced showing the number of busy calls and hang ups, which the customer can use to determine whether it's economically worthwhile to reschedule. Anything that makes management's job easier is preferable, and Telecalc's approach does that.

The MIS-1 and RT-10 gather call information through the use of a line scanner. The scanner resides at the customer's premises and bridges the telephone switching equipment, Centrex or PBX, to monitor the activity on the trunk and station lines. While the RT-10 works with digital PBXs, it will monitor only analog telephone calls. This is a decided disadvantage, given the proliferation of digital PBXs on the market.

The RT-10 functions with any vendor's automatic call distribution (ACD) facilities, as well as with uniform call distribution (UCD) services associated with Centrex systems.

> The Perimeter offering works with PBXs and Centrex; the Telecalc unit is for Centrex only.

The MIS-1 is quite restricted, working only with Centrex and UCD. Telecalc claims its MIS-2, now under development, will remove those restrictions by functioning with PBXs and Centrex.

The line scanner's output is fed into a personal computer (an IBM Personal Computer XT- or AT-level machine for Telecalc; a Personal Computer AT-level machine for Perimeter) that . does the number crunching needed to provide the management information. Both products present the data on the personal computer's monitor, and hard copies can also be printed out. Perimeter has taken information presentation a step further by offering a wall-hanging flat-panel display. Telecalc has no counterpart.

Calls on display

The MIS-1 is suited for large organizations that require regional offices to report phone-room activity to some central location. Using the Executive Polling feature, a manager can poll up to 150 other MIS-1 remote systems overnight to receive activity summary reports showing call activity detail, call volume handled and quality of service rendered. With the MIS-1 location analysis feature, the manager can immediately poll single locations to receive activity data and have it immediately displayed or printed out.

Two call management systems compared

	Vendor/Product	
	Perimeter Technology, Inc. Nashua, N.H./ RT-10	Telecalc, Inc. Bellevue, Wash./ MIS-1
Centrex/PBX interface	Both	Centrex
Remote-site polling		✓
Price	$25K to $40K	Not available

SOURCE: TMS CORP., DEVON, PA.

The MIS-1 and RT-10 both provide real-time and printed information. Users can obtain summary statistics for agent or group performance, or the performance of individual agents can be presented. For example, the phone-room supervisor can see the number of incoming and outgoing calls, average length of calls in minutes, total conversation time and agent status (on phone, on hold, available or unavailable) for any specified time of day. Users can also obtain performance information, such as the number of rings before an agent picked up a call and the length of time callers waited in the queue before hanging up.

The RT-10 appears to do a better job displaying information, however. The system employs color-coded bar graphs that show trunk group activity and uses Arabic numerals to indicate the number of calls in a particular condition. Color bars and numeric designators can be produced for all trunks and all attendant groups.

The MIS-1 does not provide color-bar graphs to show call activity, but does present trunk status and agent activity in real-time columnar form. The system displays trunk status, showing how many trunks are handling incoming calls, outgoing calls, trunks in queue or trunks idle.

Both systems allow managers to obtain a macro- or micro-view of the system status. Such data as the average call-answer speed, maximum expected call-answer delay, holding time of the longest call, number of calls handled today and number of calls abandoned from on-hold and from ringing can be obtained for individual agents or groups. All data can be used to determine threshold parameters and activate alarms when they are approached.

RT-10 can also calculate trunk overflow projections by examining the average length of time a caller spends in a queue before hanging up. That time can be used to establish a performance threshold that warns phone-room supervisors that a large number of caller hang ups is imminent. The MIS-1 cannot perform overflow projections in real-time, because it doesn't accumulate time-in-queue and busy-line data. Rather, such data is obtained by the company from the local telephone company central office.

The color bar chart scheme used by RT-10 permits phone-room supervisors to ascertain the system's status at a glance. That's one of the features Kate Lazarovich, telemarketing manager for Paula Young, Inc., in South Easton, Mass., cites as an RT-10 strength. "With our [AT&T] System 75, we were unable to get the real-time information we needed to manage telemarketing and service operations effectively. Now, on one screen, I can see exactly what's going on with our trunks and each agent," she says.

The company installed the RT-10 last April and uses it to monitor 12 national trunks and 14 extensions for both telemarketing and customer service groups.

In summary, while the MIS-1 provides a wealth of useful information, the RT-10's graphics and color-coded situation analysis looks like the better approach. Much useful information is shown at one time, and it has the capability of presenting more real-time information than the current Telecalc product.

In addition, the RT-10 will appeal to more users because of its ability to work with Centrex and PBXs and its facility for handling ACD and UCD. The new Telecalc MIS-2, according to the vendor, promises to remedy those shortcomings, but that product has no scheduled release date. ◪

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

Planning to install a Broadband LAN*/MAP**?...

*Local Area Networks
**Manufacturing Automation Protocol (IEEE 802.4)

Factory floor automation, universities, hospitals and commercial developments are rapidly standardizing on broadband technology as the media for their communications requirements.

As the most complete broadband products supplier of its kind, Anixter has become the supplier of choice for installers and users alike.

Anixter's network of distribution centers, located in every major market of the United States, Canada, the United Kingdom and Belgium stock all of the products required for broadband installations.

Anixter also provides its customers with its exclusive Action electronic order entry and inquiry system. Call your nearest Anixter location for information.

Visit the Anixter Booth #'s 1218-1219 at the TCA Show.

...ANIXTER® is the answer!

Consult the yellow pages under *"wire"* for the Anixter stocking location in your area.

ANIXTER
Wiring Systems Specialists
Voice • Video • Data • Power

CORPORATE HEADQUARTERS: ANIXTER BROS., INC.
4711 Golf Road, Skokie, IL 60076, (312) 677-2600 — Telex 289464

© 1987 Anixter Bros., Inc.

CUT AND MAIL TO:

ANIXTER DEPT LAN/MAP
4711 Golf Road, Skokie, IL 60076

☐ Please send me more information on Anixter's LAN and MAP products.

Name________________________

Title________________________

Company________________________

Address________________________

City____________ State______ Zip______

NW928